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User-Side Subsidies for the Elderly and Handicapped in Lawrence, MA

UMTA/TSC Evaluation Series

Final Report
June 1984



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16. Abstract			
<p>Funding provided by the Service and Methods Demonstration (SMD) Program of the U.S. Department of Transportation, Urban Mass Transportation Administration, was used to subsidize the bus, taxicab, and wheelchair lift-equipped van travel of elderly and handicapped residents of Lawrence, Massachusetts, in a program that began in July 1978. Eligible persons registering for the program could buy tickets that allowed them to make a cab journey at half the normal fare, or to ride the bus for one cent instead of the fifteen-cent fare paid by elderly non-participants in the program. Most of the subsidized lift-equipped van rides cost participants \$2.50, one-third of the price billed by the service provider.</p> <p>The program produced positive outcomes for the people registering for it as well as for the taxi industry. Project use grew steadily from the outset and resulted in modest increases in mobility for the registrants, who tended to come from the most mobility-disadvantaged segments of the eligible population.</p> <p>The taxicab element of the program was continued under local sponsorship after the termination of demonstration funding. The lift-equipped van element was terminated during the demonstration by the withdrawal of the single service provider, but was reinstated in the post-demonstration phase under local sponsorship. The bus element of the program was not continued beyond the cessation of federal funding, largely because of administrative and institutional considerations.</p>			
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PREFACE

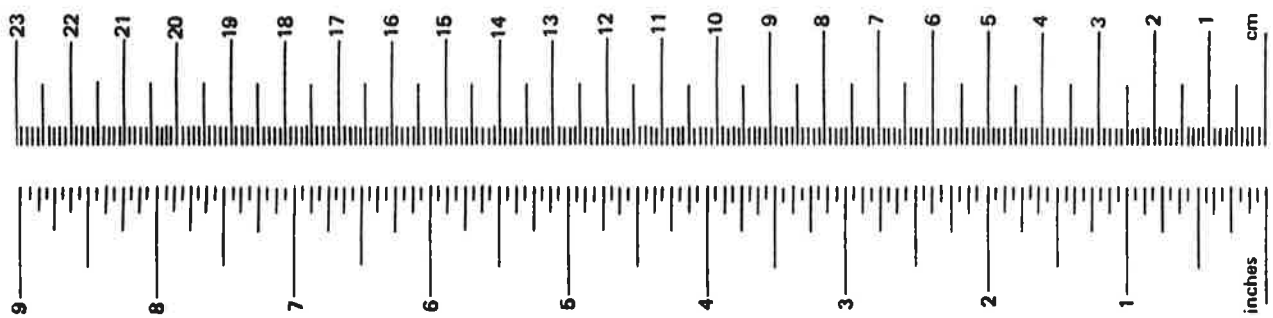
This evaluation of the Lawrence User-Side Subsidy Demonstration Project was prepared in the Boston, Massachusetts office of Charles River Associates Incorporated (CRA) for the Transportation Systems Center (TSC) of the U.S. Department of Transportation (DOT) under Contract Number DOT-TSC-1757, as part of the Service and Methods Demonstration (SMD) Program, sponsored by the Urban Mass Transportation Administration (UMTA). Michael Nelson served as CRA's evaluation manager and principal investigator. Bruce Spear of TSC served as technical advisor and monitor for the evaluation while Larry Bruno was the UMTA Project Manager.

Many individuals contributed to the development of this evaluation report. Within CRA, Michael Nelson directed the evaluation and was the principal author of this report, while Michael Kemp wrote the Executive Summary. J. Richard Kuzmyak, former CRA evaluation manager, designed the evaluation strategy, supervised most of the data collection effort, and contributed many valuable insights. Jane Piro supervised data processing, conducted data analyses, and contributed draft material throughout the report. Stephen Hendrick conducted or was responsible for data processing, while Frank Kelly and Terry McKiernan organized and edited the final report. Other major CRA contributors included Ritva Morris and Tim Hughes, publications; Susan Novich, graphic arts; and Ruthellen O'Brien and Lisa Krause, secretarial. The efforts of all of these individuals were supervised by Daniel Brand, CRA's officer in charge of work conducted for the SMD program, who provided overall guidance and many helpful suggestions.

Although CRA accepts full responsibility for the information and conclusions presented in this report, the evaluation would not have been possible without the cooperation and assistance of many other individuals. In particular, Roberta Leites, Jack Pavlenkov, Dot Rembis, and Monica Fairburn of the Lawrence project staff were very helpful in providing needed information from the site. Bruce Spear (TSC) provided numerous insightful observations and coordinated the UMTA/TSC review of the draft final report. Significant contributions to the successful completion of this evaluation were also made by Bruce Winston, Mark Imhoff, and Kenneth Cone, former CRA study team members.

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures				Approximate Conversions from Metric Measures			
Symbol	When You Know	Multiply by	To Find	Symbol	When You Know	Multiply by	To Find
LENGTH							
in	inches	2.5	centimeters	mm	millimeters	0.04	inches
ft	feet	30	centimeters	cm	centimeters	0.4	inches
yd	yards	0.9	meters	m	meters	3.3	feet
mi	miles	1.6	kilometers	km	kilometers	0.6	miles
AREA							
in ²	square inches	6.5	square centimeters	cm ²	square centimeters	0.16	square inches
ft ²	square feet	0.09	square meters	m ²	square meters	1.2	square yards
yd ²	square yards	0.8	square meters	m ²	square kilometers	0.4	square miles
mi ²	square miles	2.6	square kilometers	km ²	hectares (10,000 m ²)	2.5	acres
	acres	0.4	hectares	ha			
MASS (weight)							
oz	ounces	28	grams	g	grams	0.035	ounces
lb	pounds	0.45	kilograms	kg	kilograms	2.2	pounds
	short tons (2000 lb)	0.9	tonnes	t	tonnes (1000 kg)	1.1	short tons
VOLUME							
tsp	teaspoons	5	milliliters	ml	milliliters	0.03	fluid ounces
Tbsp	tablespoons	15	milliliters	l	liters	2.1	pints
fl oz	fluid ounces	30	milliliters	l	liters	1.06	quarts
c	cups	0.24	liters	l	liters	0.26	gallons
pt	pints	0.47	liters	m ³	cubic meters	36	cubic feet
qt	quarts	0.96	liters	m ³	cubic meters	1.3	cubic yards
gal	gallons	3.8	liters				
ft ³	cubic feet	0.03	cubic meters				
yd ³	cubic yards	0.76	cubic meters				
TEMPERATURE (exact)							
oF	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	oC	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature



*1 in. = 2.54 cm (exactly). For other exact conversions and more detail tables see NBS Misc. Publ. 286, Units of Weight and Measure. Price \$2.26 SD Catalog No. C13 10 286.

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EXECUTIVE SUMMARY

OVERVIEW

Funding provided by the Service and Methods Demonstration (SMD) Program of the U.S. Department of Transportation, Urban Mass Transportation Administration, was used to subsidize the bus, taxicab, and wheelchair lift-equipped van travel of elderly and handicapped residents of Lawrence, Massachusetts, in a program that began in July 1978. Eligible persons registering for the program could buy tickets that allowed them to make a taxi journey at half the normal fare, or to ride the bus for one cent instead of the fifteen-cent fare paid by elderly non-participants in the program. Most of the subsidized lift-equipped van rides cost participants \$2.50, one-third of the price billed by the service provider.

The program produced positive outcomes for the people registering for it as well as for the taxi industry. The logistical aspects worked quite smoothly. Project use grew steadily from the outset and resulted in modest increases in mobility for the registrants, who tended to come from the most mobility-disadvantaged segments of the eligible population.

The taxicab element of the program was continued under local sponsorship after the termination of demonstration funding. The lift-equipped van element of the program was terminated during the demonstration by the withdrawal of the single service provider, but was reinstated in the post-demonstration phase under local sponsorship. The bus element of the program was not continued beyond the cessation of federal funding, largely because of administrative and institutional considerations.

WHAT WAS THE NATURE OF THE DEMONSTRATION?

This was one of a series of federally-sponsored demonstrations concerning the practicalities and outcomes of "user-side subsidies" -- a form of public transportation subsidy whereby the assistance is vested in the passengers (using discounted tickets, charge slips, or other vouchers) rather than directly in the carriers. Other demonstrations based on this approach have been implemented in Danville (Illinois), Kinston (North Carolina), and Montgomery (Alabama).

User-side subsidies have several potential advantages over provider-side assistance. For example, they are likely to distort competitive forces less in areas where there is a number of providers. Because the amount of subsidy paid to a provider depends directly on the number of assisted patrons carried, an incentive remains to compete for riders. User-side subsidies can also simplify fare policy deliberations. They allow the subsidizing agencies to keep separate their economic efficiency objectives in fare setting ("What fares will make the urban transportation system work most efficiently?") from their social welfare objectives ("To which groups of the population do we wish to provide low-fare public transportation to increase their mobility?"). If user-side assistance is employed to achieve the social welfare goals, then the level of subsidy and the setting of fares for the rest of the riders can be decided solely on the grounds of making the transportation system work efficiently.

The Lawrence demonstration provided user-side assistance to elderly and handicapped registrants to help defray the costs of three forms of local transportation:

- Conventional taxi services provided by participating cab companies, which constituted almost all of the taxicab supply in the city;
- Fixed-route bus services, operated by a private firm under contract to the Merrimack Valley Regional Transit Authority (MVRTA); and
- Wheelchair lift-equipped van services, provided (for a limited period) by one of the taxicab firms.

Also as part of the demonstration, pre-existing restrictions on shared-ride taxi service were removed.

The demonstration was funded and designed to show how the introduction of user-side subsidies affected both the providers and the users of the services. How many of the people eligible for subsidized travel would take advantage of the program? What types of people would benefit the most? How much new travel would be ascribable to the program? How would participating bus and cab firms respond? Additionally, the demonstration sought to generate logistical experience that could be drawn on by other communities considering similar programs. How could the subsidies be administered at an acceptable cost? What sorts of problems could be expected? How much fraudulent behavior was to be anticipated?

WHERE AND WHEN DID THE DEMONSTRATION TAKE PLACE?

Lawrence is a manufacturing city of almost 68,000 people (in 1978), located in northeastern Massachusetts. Its land area of just less than 7 square miles is developed fairly densely, with an average population density of almost 10,000 people per square mile. In consequence, travel distances within the city itself tend to be quite short.

It is estimated that roughly 13,700 residents of the city were eligible to register for the program, of which almost three-quarters were aged 65 or over, while the remaining quarter were non-elderly, handicapped people.

Planning for the demonstration began in November 1977. After some small administrative delays, user-side assistance for eligible bus and shared-cab patrons began in late July 1978. The lift-equipped van element of the program commenced in April 1979 and ended (because of withdrawal by the operating firm) at the end of November 1979. Federal demonstration funding for the assistance program was depleted by September 1980, at which time the regional transit authority assumed responsibility for financing the shared-cab component of the program and terminated the bus element. Later, the lift-equipped van service was reinstated under local sponsorship.

HOW DID THE PROGRAM WORK?

All Lawrence residents who either were 65 years old or over or were handicapped with specified disabilities were eligible to register for the bus and shared-cab program. Registration required a personal interview at the program office to establish eligibility, after which the registrant was issued a photo identification card, to be shown both when purchasing reduced-price tickets and when tendering the tickets in payment for travel.

A registrant could purchase up to two transit ticket books and four taxi ticket books at one time, although in the early months of the demonstration no limits were placed on purchases. The bus ticket books comprised 25 tickets and cost 25 cents, so each ticket cost the participant 1 cent. The ticket was good for travel on any of the MVRTA bus routes operated in and through Lawrence. Since the fare charged to elderly (60 years old or over) or handicapped patrons not registered with the user-side subsidy program was 15 cents, the program provided a discount of over 93 percent. No limit was placed on the number

of reduced-fare bus rides that participants could make in a given time period.

Taxi ticket books contained 40 tickets marked with a face value of 25 cents each, and were sold for \$5.00. Thus, the tickets cost registrants one-half of their face value. They could be used, at their face value, to pay for taxi rides, with two limitations:

- The amount by which any fare exceeded \$2.50 (or \$2.75, following a 25-cent fare increase in July 1979) had to be paid in cash (that is, no more than 10 tickets could be accepted for any single ride); and
- No more than four one-way taxi trips were to be paid for by program tickets in any one calendar week.

Eligibility for the wheelchair lift-equipped van element of the program was limited to those Lawrence residents confined to a wheelchair or walker or requiring an escort while traveling. A standard photo identification card was issued following a registration interview at the project office or the applicant's home.

No tickets were used in the administration of the van service. The fare for a one-way trip within 5 miles of the downtown area was set at \$7.50, plus 50 cents per additional mile. An attendant was provided for an extra charge of \$2.00, or the registrant could provide his or her own escort for 50 cents. From the total fare, a subsidy of \$5.00 was subtracted and the remainder was collected in cash from the registrant. The van driver completed a voucher showing the fare computation, and a copy of the voucher was subsequently used by the operating firm to reclaim the subsidy amount from the program.

In order to reduce opportunities for fraudulent use, bus and cab tickets were imprinted with the purchaser's identification number when they were first bought. Van vouchers also showed the identification of the participant.

HOW DID THE PROGRAM SERVICE RELATE TO THAT FOR THE GENERAL PUBLIC?

The program registrants used the same bus and taxi services that were provided to the rest of the public. In anticipation of the demonstration, the city taxicab code had

been amended to permit shared-riding at the discretion of the driver, rather than (as previously) at the discretion of the first hirer. But the fact that the driver or firm has the option to provide shared rides does not imply that either program registrants or other members of the public would necessarily travel with other independent riders for part or all of their cab journeys.

Taxicab fares in Lawrence are regulated by the city, which sets upper limits on fare levels. The city is divided into two zones, a central one and an outer-collar zone. Until July 1979, the maximum fare for travel entirely within one zone was \$1.25, and \$1.50 was charged for travel between the zones. For groups of people traveling together between the same two points, an extra 50 cents was charged for each person after the first. An increase of 25 cents in the allowable fare was assessed beginning in July 1979. For journeys extending outside the city limits, maximum fares were not specified.

At least four of the cab firms charged fares that were less than the city-regulated maximums. One firm charged 25 cents less for the base zone charges, while others offered lower flat rates for school children, the elderly, the handicapped, or subscription patrons. Subscription and reservation cab service was well established in Lawrence before the demonstration began.

HOW WELL WAS THE NEW PROGRAM ACCEPTED?

Eight of the city's ten taxicab firms -- owning 82 percent of the existing vehicle permits -- joined the program at the outset. One of the non-cooperating firms was bought up by a participating firm in 1978, and the other joined the program in January 1979, after which time all of the cabs operating in the city would accept program tickets.

Interviews with local social service agencies prior to the program's introduction revealed generally negative attitudes. With the singular exception of the Area Agency on Aging, in most cases agency staffs anticipated little or no benefit for their clients. While agency involvement in providing client referrals and in distributing promotional materials turned out to be a little higher than might have been expected given the pre-demonstration attitudes, in general, Lawrence's social service agencies took little or no active role in program registration, trip scheduling, or funding.

Almost 4,200 people, roughly 30 percent of those eligible for the program, had registered to participate by February 1980. The registrants tended to be drawn from the most mobility-disadvantaged segments of the eligible population. By comparison with the group of eligible people who did not register, the registrants were disproportionately female, homemakers, unemployed, and from households with lower incomes. Of those registered, 72 percent had no driver's license, and 64 percent came from households owning no private vehicles. The corresponding figures for eligible non-registrants were 49 percent and 0.6 percent, respectively.

WHAT EFFECTS DID THE PROGRAM HAVE ON TRANSPORTATION SERVICE ATTRIBUTES?

Aside from the project's reductions in effective fare levels, the most significant changes in the attributes of transportation service concerned a substantial increase in the level of taxicab shared-riding. This increase was attributable both to the project's change in the regulations governing shared rides, and to contemporaneous changes in such factors as fuel prices, which caused operators to seek out all reasonable opportunities to reduce resource consumption and costs. Taxi operators made no significant effort to differentiate the service they offered to project registrants from that provided to non-registrants. However, wait times did increase slightly during the project, possibly as the result of such factors as dispatcher efforts to facilitate shared-riding and project-related volume changes. Ride times also increased somewhat, possibly as the result of the increase in shared-riding activity.

WHAT IMPACTS WERE OBSERVED ON TRAVEL BEHAVIOR?

Lawrence residents in the program made use of the taxicab and bus subsidies to widely varying degrees and in different combinations. Roughly one in six of the registrants did not make any use of the program. Of the remaining people who had registered, about 28 percent made use of the bus subsidy but not the taxi program, another 28 percent used taxi tickets but not bus tickets, and the remaining 43 percent used both types of subsidy.

Those using the bus element of the program at some time made an average of 7.8 project bus trips per month. Over one-quarter of all project registrants made five or more

subsidized bus trips each month. In the majority of months, total bus ticket usage varied between 15,000 and 20,000, with a peak of over 23,000 rides in May 1980. It is thought that about one-quarter of these bus trips would not have been made in the absence of the program, and that about another one-sixth of the bus rides came from diversions from other modes of travel.

Among people choosing to use taxi tickets at some time, the average number of subsidized cab rides was 3.7 per month. About 42 percent of all registrants made at least 1 project taxi ride each month, and 10 percent averaged 7 or more rides per month. In most months after the program had become established -- following the initial four months of steadily increasing ridership -- the total number of project taxi rides varied between 7,000 and 10,000, peaking at almost 11,000 rides in April 1980. Just over one-quarter of the subsidized cab trips would not have been made without the program, the equivalent of almost one project-induced ride per taxi-using registrant per month. Another quarter of project taxi trips resulted from diversions from other modes of travel.

Use of the lift-equipped van element of the program reached a peak of 82 rides per month in July 1979, three months after the service commenced. By October of the same year, however, the patronage had fallen to 30 trips, and the provider withdrew from that part of the program in the following month.

All of these ridership impacts represent relatively small percentage changes in the total tripmaking by registrants. Any changes ascribable to the subsidy program in the choice of trip destination or in the timing of trips were either minor or nonexistent.

HOW DID THE PROGRAM AFFECT THE SUPPLIERS OF THE SERVICES?

Overall, the Lawrence user-side subsidy program was beneficial to the city's taxicab firms. It is estimated that the program increased the number of cab trips in Lawrence by a total of almost 8 percent through increased travel frequencies and diversions from other modes. Interviews with the taxi operators revealed substantially favorable opinions of the program.

For the most part, the level of extra administrative effort required of taxi firms for their participation in the program appeared modest, although there were a few complaints and suggestions in this regard.

Ridership on the MVRTA bus services probably grew by about 9 percent in total as a result of the new and diverted trips induced by the program. This growth occurred disproportionately during off-peak hours, when additional passengers could be accommodated most easily.

But neither the transit agency nor the private firm that operated the services under contract felt that these benefits were significant. The program had no impacts on the overall financial status of the bus services, since revenues from the redemption of project tickets simply replaced farebox revenues and direct, provider-side subsidies. There was no tangible compensation for the extra administrative burdens imposed on the provider, primarily in ticket handling and increased monitoring and auditing requirements. In consequence, the bus company expressed a low level of enthusiasm for the program.

WAS FRAUD A SIGNIFICANT PROBLEM?

There is some limited evidence that the non-transferable tickets were sometimes used by people other than those to whom they had been sold, but this form of abuse is thought to have been quite minor. The administrative procedures did not allow project staff to monitor closely whether participants exceeded the weekly limits on use of the cab program, but consistent overuse was confined to a very small proportion (about 1.5 percent) of the registrants.

WHAT DID THE PROGRAM COST?

It is estimated that the pre-operational planning for the project involved on the order of \$10,000 of resources in staff time and technical assistance from outside sources, equivalent to roughly \$16,000 in 1983 dollars. Such costs could be lower at other places able to build on the user-side subsidy experience in Lawrence, Kinston, Montgomery, Danville, and elsewhere.

The ongoing fixed costs of the project averaged about \$4,650 per month in 1979, or \$6,350 per month in 1983 dollars. The elements comprising this amount were:

- User registration, accounting for over 2 percent, although some of the costs attributed to registration were for activities associated with the evaluation of the demonstration;

- General program support (promotion, information dissemination, handling complaints, maintaining records, coordinating with other city agencies, and so on), accounting for almost 35 percent of the monthly fixed costs;
- Ticket distribution and redemption activities, 42 percent of the total;
- Lift-equipped van service administration, 2 percent of the total; and
- Overhead costs (rent, utilities, materials and supplies), almost 19 percent of the monthly fixed costs.

The variable costs of the program were the user-side subsidy payments themselves. Over the life of the demonstration, these averaged \$1.51 per project taxi ride (\$2.06 in 1983 dollars), 14 cents per bus ride (19 cents in 1983 dollars), and \$5.00 (\$6.83 in 1983 dollars) per lift-equipped van ride.

WHAT HAS HAPPENED SINCE THE FEDERAL DEMONSTRATION ENDED?

Largely because of administrative and institutional considerations, the bus element was terminated following depletion of the federal demonstration funding. The taxicab element has been maintained, however, with funding provided by the MVRTA. The restriction to a maximum of four one-way program rides per week has been liberalized; registrants are now limited to six coupon books per month, and this feature can be more easily monitored by the program office.

The lift-equipped van element of the program was reinstated under local sponsorship in March 1981, with a total of five providers and a higher fare level. By early 1984, the program had over 500 registrants and was carrying some 350 to 400 rides each month.

WHAT FACTORS MAY AFFECT THE TRANSFERABILITY OF THE LAWRENCE EXPERIENCE?

As with any demonstration, a person seeking to use the Lawrence experience to predict the potential results of instituting a similar program elsewhere needs to draw a very

careful comparison between the circumstances in Lawrence and the environment in which the similar program is being considered. Among locally-specific factors that may have influenced the outcomes in Lawrence are:

- The geographically small, densely-populated area;
- The large number of existing taxicab firms, their previous experience with shared-riding and subscription service, the zone fare structure, and the (limited) existing price competition among the firms;
- A sharp increase in gasoline prices during the course of the demonstration; and
- The existing provider-side subsidy arrangement for the bus operating firm.

1. DEMONSTRATION BACKGROUND AND OBJECTIVES

1.1 INTRODUCTION

The mobility needs of special user groups, especially the elderly and handicapped, have come to light in recent years as a significant public policy issue. Within cost constraints, the Urban Mass Transportation Administration (UMTA) and other governmental agencies have adopted a general policy of attempting to satisfy the transportation needs of these groups. A number of alternatives are available for providing such services, though these alternatives vary substantially in terms of their costs and other impacts. Public agencies are, therefore, often put in the position of having to make difficult tradeoffs among these services and their attributes before a preferred, cost-effective service concept is found.

The demonstration project conducted in Lawrence focused on the concept of "user-side subsidies" for conventional transit and privately operated door-to-door taxi and lift-equipped van service to bring about improved mobility for elderly and handicapped individuals. In contrast with the more traditional approach of providing an operator with a guaranteed subsidy to cover the cost of a given service, user-side subsidies involve the direct reimbursement to individuals of some or all of the costs of their local trips. Specifically, under a user-side subsidy arrangement, target group individuals are able to use prepurchased scrip or tickets, vouchers, or some other medium to purchase transportation services from existing suppliers at a reduced out-of-pocket cost. The subsidy medium (ticket, voucher, etc.) is typically collected from the user by the service provider at the time of each delivered trip, and returned to the subsidizing agency for reimbursement.

It is important to note that user-side subsidies are a subsidy distribution mechanism, and not a specific transportation service per se. The rationale for this type of approach to the mobility needs of the elderly and handicapped rests on the assumption that the price of certain transportation services may be a major barrier to their use. By reducing the effective price of such services, user-side subsidies can increase the transportation options available to the elderly and handicapped.

At the same time, user-side subsidies are (theoretically) more efficient than provider-side subsidies because payment is made only for service that is actually delivered. Operators cannot take the subsidy for granted and only receive benefits under the subsidy to the extent that they carefully sense the travel needs of the public and offer levels of service that are competitive with alternatives. It is therefore hypothesized that user-side subsidies may lead to greater efficiency in the provision of transportation services, while providing funding agencies with a good deal of flexibility concerning the types of individuals and/or trips that are to be subsidized.

UMTA's rationale for studying user-side subsidies stems from its mission to identify, test and disseminate information about innovative transportation services, particularly those that may enable local areas 1) to provide transportation at lower cost, and 2) to improve the travel opportunities and mobility of the transportation disadvantaged. In recent years, UMTA's Service and Methods Demonstration (SMD) Program has examined a number of applications of the user-side subsidy concept through both demonstrations and case-study evaluations. The Lawrence demonstration can therefore be viewed as one in a series of tests of the merits and applicability of this concept.

In addition to Lawrence, the SMD Program has sponsored demonstrations of user-side subsidies in Danville (Illinois)*, Kinston (North Carolina)**, and Montgomery (Alabama).*** At each of these sites, different variations of the user-side subsidy concept were tested under different geographic and demographic conditions:

*See Crain and Associates, User-Side Subsidies for Shared-Ride Taxi Service in Danville, Illinois: Phase I, UMTA/TSC Project Evaluation Series, Report No. UMTA-IL-06-0034-77-1. June 1977.

**See Charles River Associates, User-Side Subsidies for Shared-Ride Taxis in Kinston, North Carolina, UMTA/TSC Project Evaluation Series, Report No. UMTA-NC-06-0002-80-1, October 1980.

***See Charles River Associates, User-Side Subsidies for Taxis and Buses in Montgomery, Alabama, UMTA/TSC Project Evaluation Series, Report No. UMTA-AL-06-0003-83-1, February 1983.

Danville was the first user-side subsidy demonstration, and involved the use of vouchers for taxi trips in a small urban area (both in terms of population and land area).

Kinston demonstrated the use of scrip as an alternative subsidy distribution mechanism to vouchers for taxi trips. The demonstration setting was somewhat more rural than Danville, with a lower population density.

Montgomery again tested the use of vouchers for taxi trips, but also introduced the use of tickets for user-subsidized fixed-route bus trips on a transit system operated by a public agency. Montgomery also tested the introduction of a grid-fare system as a means of facilitating shared-riding on a taxi system that had a meter-based fare structure. Finally, the Montgomery site was substantially larger than either of the two previous sites, both in terms of land area and population.

Lawrence, like Montgomery, applied the user-side subsidy concept to both taxis and fixed-route buses. In Lawrence, however, the bus service was operated by a private contractor. Lawrence also used tickets in place of vouchers for taxi trips, and applied user-side subsidies to lift-equipped van services for the severely handicapped. Lawrence had the highest population density of any of the demonstration sites, and consequently provided an opportunity to study the concept in a more urban environment. Also, as part of the evaluation process, an extensive travel diary survey was conducted in Lawrence (see Appendix A) that enabled changes in travel behavior and mobility benefits that accrued to recipients of user-side subsidies to be investigated in detail.

In addition to the user-side subsidy element, the Lawrence demonstration also involved changes in the regulations governing the practice of sharing taxi rides.* Before the

*Under shared-ride taxi service, taxi operators may simultaneously transport parties traveling separately between different origins and destinations within a given cab. This is the opposite of exclusive ride service, under which each party is served individually (i.e. one party is left off at its destination before the taxi proceeds to the origin of the next party's trip). Group riding refers to a single party of two or more individuals who are traveling together between the same origin and destination. This can take place in the context of either shared or exclusive ride taxi service.

demonstration began, Lawrence taxicab operators offered shared-ride service, although a city ordinance required that the first passenger give consent. Fares were calculated from a system of zones and were the same for exclusive and shared rides. While the demonstration fare discount involved no changes in the preexisting zonal system and applied equally to shared and exclusive rides, the city's taxicab code was changed for the demonstration so that shared riding could take place without the permission of the first passenger. This change could reasonably be expected to lead to improved vehicle productivities, possibly at the expense of various attributes of passenger-perceived service quality. However, regardless of its other effects and/or merits, this change was needed for taxi service in Lawrence to qualify as a form of mass transit that was eligible for Federal subsidies, since UMTA does not fund services in which individuals can reserve vehicles for their own exclusive use.*

1.2 PROJECT OBJECTIVES AND EVALUATION ISSUES

The principal goal of this project was to demonstrate the cost-effectiveness of user-side subsidies in a multimodal environment as a means for improving the mobility of the elderly and handicapped. A secondary objective was to increase transit vehicle productivity. These goals correspond directly to stated objectives of the SMD Program, and are significant in the context of local priorities as well. By reducing the price of travel, the user-side subsidy program could be expected to lead to increased rates of tripmaking, or to increased temporal and spatial travel alternatives, by making some trips feasible that would previously have been beyond an individual's budget limitations. Alternatively, participants could choose to continue old travel habits with reduced expenditures and thus use the subsidy to reduce the cost of transportation.

If the effective reduction in taxi fare led to increased patronage, the productivity of taxi operations could improve. This improvement could be further enhanced by the formal adoption of shared riding as part of the project and, in turn, could stimulate changes in the supply of taxi service. Likewise, increases in transit patronage could improve transit

*It should be emphasized that while shared-ride service was needed in this demonstration to meet Federal requirements, it is not inherently a co-requisite to implementation of user-side subsidies.

vehicle productivity and lead to service changes as well. Broader, external effects (e.g., on social service agencies) could also result from the program and its effects on travel behavior.

Overall, the purpose of this evaluation is to enhance the understanding of operational issues and factors that determined the impacts of this user-side subsidy program and, consequently, the circumstances under which this concept could most beneficially be applied elsewhere. Specific research issues addressed in this effort, which are described in detail below, fall into the following general categories:

1. The operational and administrative feasibility of the user-side subsidy concept as demonstrated in the project;
2. The impact of the user-side subsidy on the mobility of the target group;
3. The impact of the user-side subsidy on the supply of transportation services; and
4. The impact of the user-side subsidy on social service agencies.

1.2.1 Concept Feasibility

In large part, the feasibility of the user-side subsidy concept depends upon the acceptance and cooperation of transportation service providers. This particular demonstration involved the participation of a relatively large number of taxi operators, each of whom was required to collect travel discount tickets, log project trips, and wait for reimbursement. Similarly, the bus operator had to keep track of large numbers of tickets, submit them to the subsidy program, and wait for reimbursement. Chair-car operators were required to fill out project vouchers in a satisfactory manner and, again, wait for reimbursement. The ability of the subsidy program to forge a practical working relationship between transport suppliers (many of whom may be leery of government intervention) and the requirements of the concept for regulatory adherence and accountability is an important evaluation issue.

The subsidy manager, in this case the City of Lawrence, must account for project usage (subject to various auditing and

verification checks), resolve all billing inconsistencies, and see to the timely repayment of transport suppliers. In addition, the manager has the responsibility of screening and registering users, answering their complaints, and enforcing the rules and restrictions of the program.

In general, the cost and complexity of administering a transportation subsidy program in which reimbursements to providers are based on an accounting of trips made by eligible users are expected to be significant. Such administrative requirements may be as important as the direct (e.g., travel behavior) impacts resulting from the subsidies themselves when the applicability of this concept is considered in other settings. It is therefore essential that differences in administrative feasibility and impacts that are attributable to different subsidy mechanisms (i.e., tickets vs. vouchers) be identified and investigated to the extent feasible.

1.2.2 Mobility of Project Users

The user-side subsidy concept is targeted at people whose ability to travel when and where they desire is often severely limited by their economic situation or physical condition. Elderly and handicapped individuals generally have less income and fewer transportation alternatives than the general public, and often require physical assistance. Reduced-cost transit service may be most attractive for individuals with the lowest incomes, particularly the able-bodied. Taxis may also be quite beneficial, as they offer the door-to-door service quality of automobiles and entail a minimal effort or wait on the part of the rider. The chair-car service may be the most attractive for wheelchair-confined individuals, who may find it difficult or impossible to utilize vehicles such as conventional buses or taxicabs that are not specially equipped to board and transport severely handicapped patrons.

It should also be noted that the project may be expected to cause changes in some non-cost attributes of transportation services. For example, average in-vehicle travel time may increase if the frequency of shared riding increases. The nature and magnitude of such changes must be considered along with the changes in out-of-pocket costs when the impacts of user-side subsidies on registrant mobility are examined.

Overall, the amount and character of travel by the elderly and handicapped may change in a number of important ways when they are provided with user-side subsidies. Evaluation of these effects focuses on three fundamental issues: 1) the

attractiveness of the program to the target group; 2) the beneficiaries of the program; and 3) the types of benefits that accrue to users.

The first issue involves the extent to which the user-side subsidy program was sufficiently desirable to attract target individuals to register. Unlike other potential demonstrations, where the project service would constitute a new and untried alternative, Lawrence residents generally had access to the project modes in the predemonstration environment. This familiarity may have reduced the need for the project to provide introductory or explanatory information to potential users, and may have enhanced registration in comparison to the provision of a totally new service. However, many people may not have found it in their interest to make use of the project, and it is of interest to see how they differed from project registrants. Nonparticipation may reflect a lack of need for project services in general due to the availability of travel alternatives, or a lack of need for subsidies (e.g., due to high incomes). Other factors, such as aversion to taxi or bus service, may also be significant, and their importance must be established.

The second issue involves the extent to which different types of registered individuals made use of the project. Users with different characteristics may have had dramatically different rates of overall project utilization, as well as project utilization by mode. Indeed, the mode choice behavior of project users, given the option of using different modes at discount rates, is a topic of considerable interest. It may be possible to draw inferences from the characteristics of users and nonusers of the project subsidies to make projections of the potential demand for subsidized service at other sites.

The third issue focuses on the various ways in which users derived benefits from the project. The subsidy might allow more trips to be made than would have been made without the subsidy. These might be new trips or trips that would have been made using a different mode. Alternatively, if the same total number of trips were made without significant mode changes, an income effect might result. The subsidy may also permit travel to more preferred destinations or for additional trip purposes. Furthermore, with an improvement in available travel alternatives, individuals may have greater discretion over the scheduling of trips and travel at more convenient times of the day, week, or month. Since improved mobility for the elderly and handicapped is the primary objective of this demonstration, a detailed assessment of these diverse effects is particularly important.

1.2.3 Transport Supply

Changes in travel frequency and mode choice resulting from the user-side subsidy program may have significant effects on the supply of transportation services. Because a given level of conventional transit service can generally be provided even in the presence of significant variations in demand, the effects of project-related changes in transit volume are likely to be reflected primarily as changes in transit operator revenue and productivity. However, service changes directed at the elderly and handicapped market could also result.

In contrast to conventional transit service, though, the quality of demand-responsive (taxi, chair-car) services is often highly sensitive to the relationship between the number of vehicles available, and the number and characteristics of individual service requests made at any given time. Therefore, any changes in travel behavior that occur because of the subsidy program may have significant industry effects. These effects may involve the overall market structure in Lawrence, or the operations and profitability of individual firms.

The overall market structure could be affected if the project leads to a change in the number or relative size of firms in the market. Also it is important to determine whether firms participating in the project experience greater or lesser benefits than those that do not. If the level of service to nonproject riders drops as a result of a firm's participation in the project, nonproject riders could shift to nonparticipating firms. It is of particular interest to examine whether firms shift into or out of the project market over time, whether project or nonproject firms increase or decrease in size during the project, and whether these shifts parallel trends in subsidized or nonsubsidized ridership.

The subsidy program could affect the structure and profitability of the individual firm in several ways. If ridership grows, firms may have to increase their effort in vehicle dispatching or maintenance. Company managers may also initiate new service or operating policies to alter their competitive position in the elderly and handicapped travel market. Such changes could include increases or decreases in the wait time experienced by individuals in target markets, improved service at particular trip generators, and advertising directed at potential project riders. If these changes result in cost increases, firms could seek greater rents from drivers, possibly leading some drivers to shift from one firm to another or to start new firms for themselves.

For individual operators participating in the project, general improvements in service productivity (and hence profitability) should occur as overall demand tends to increase and shared riding is facilitated. These improvements may be tempered somewhat if project-induced trips require extra resources (e.g., driver assistance), involve destination areas that are not routinely served, or yield lower gratuities. If productivity and profitability do increase, operators may expand vehicle utilization by working longer hours or hiring additional drivers. It is of considerable interest to establish whether such changes were made in Lawrence as a result of the demonstration project.

1.2.4 Social Service Agencies

Because the demonstration project was designed to benefit many of the clients of social service agencies, these organizations might be expected to participate in the implementation and operation of the user-side subsidy program. A number of social service agencies in Lawrence already provide transportation assistance to their clients, ranging from simple cost-sharing, to service contracts with transport suppliers, to operating entire fleets of vehicles. For these agencies, the user-side subsidy program may offer the opportunity for significant cost reductions, and enhance the range and overall productivity of agency services. For agencies that do not offer transportation services, coordination of transportation needs with the user-side subsidy project could also lead to increased agency participation and growth in the number and variety of agency programs. Changes in the cost, attendance, or scope of agency service programs associated with the project are therefore of considerable interest.

If the project produces substantial benefits for agencies or their clients, those agencies might provide funds for continuation of the project beyond the demonstration stage. While some incentives may exist for noncooperation with the project (e.g., promotional advantages of agency-managed transportation services, or problems involved in interagency coordination), the extent to which social service agencies respond and become involved should provide some indication of the potential for agency benefits resulting from user-side subsidy programs.

1.3 EVALUATION OVERVIEW

The information and analysis presented throughout this report is based on a series of data collection efforts conducted by the City of Lawrence that were designed to monitor all of the potential effects of the demonstration project described above. To a great extent, the data collection was structured in a "before-and-after" framework to identify changes that took place with the implementation of the demonstration. The before-and-after observations have been supplemented by the monitoring of exogenous events and indicators of site activity to facilitate the interpretation of before/after changes, and enhance the credibility of findings. Descriptions of each specific data collection activity, along with survey instruments and sampling plans as appropriate, are presented in Appendix A.

1.4 ORGANIZATIONAL ROLES

Organizations involved in the Lawrence User-Side Subsidy Demonstration Project and its evaluation are described below.

URBAN MASS TRANSPORTATION ADMINISTRATION (UMTA)

SMD project sponsor with overall supervisory and management responsibility.

URBAN INSTITUTE

Provided preliminary design of the user-side subsidy project under contract to UMTA, along with technical assistance and support during the project planning and implementation phases.

CITY OF LAWRENCE

SMD grant recipient, also referred to as the grantee.

LAWRENCE COMMUNITY DEVELOPMENT DEPARTMENT

Delegated responsibility by the Mayor of Lawrence for overall project administration. In charge of project and subsidy management, user registration, and data collections used to support monitoring and evaluation activities.

TRANSPORTATION SYSTEMS CENTER (TSC)

Supervised project evaluation, and conducted analyses of travel diary surveys.

CHARLES RIVER ASSOCIATES (CRA)

Assumed overall responsibility for most aspects of monitoring and evaluating the demonstration project under contract to TSC.

2. DEMONSTRATION SETTING

Evaluation of the effects of the Lawrence user-side subsidy demonstration requires an understanding of the project's environment. Important background conditions, including geographic, demographic, and transportation characteristics, must be understood to enable interpretation of changes that took place after implementation of the demonstration. Therefore, in this chapter, the predemonstration setting is described, along with exogenous changes in key characteristics that took place during the project.

2.1 SITE DESCRIPTION

2.1.1 Predemonstration

Lawrence is situated in northeastern Massachusetts (see Figure 2-1). It is located in the Lawrence-Haverhill Standard Metropolitan Statistical Area (SMSA), which is composed of 11 communities in Massachusetts and 7 cities and towns in New Hampshire.

Lawrence's 1978 population was estimated to be 67,715, with a land area of 6.8 square miles. Lawrence's median family income of \$9,442 (1970) is slightly less than that of the nation as a whole.

2.1.1.1 Land Use - Lawrence is divided into North Lawrence and South Lawrence by the Merrimack River. North Lawrence contains the central business district as well as nearly two-thirds of Lawrence's population (see Figure 2-2).

Residential development comprises the greatest single land use in Lawrence, with 21.4 percent of the city's total area occupied by single-family units and 20.7 percent by multifamily units. Vacant land is the second largest land use classification (17.6 percent). Commercial and industrial users comprise 6.4 percent and 9.7 percent of the total area, respectively.

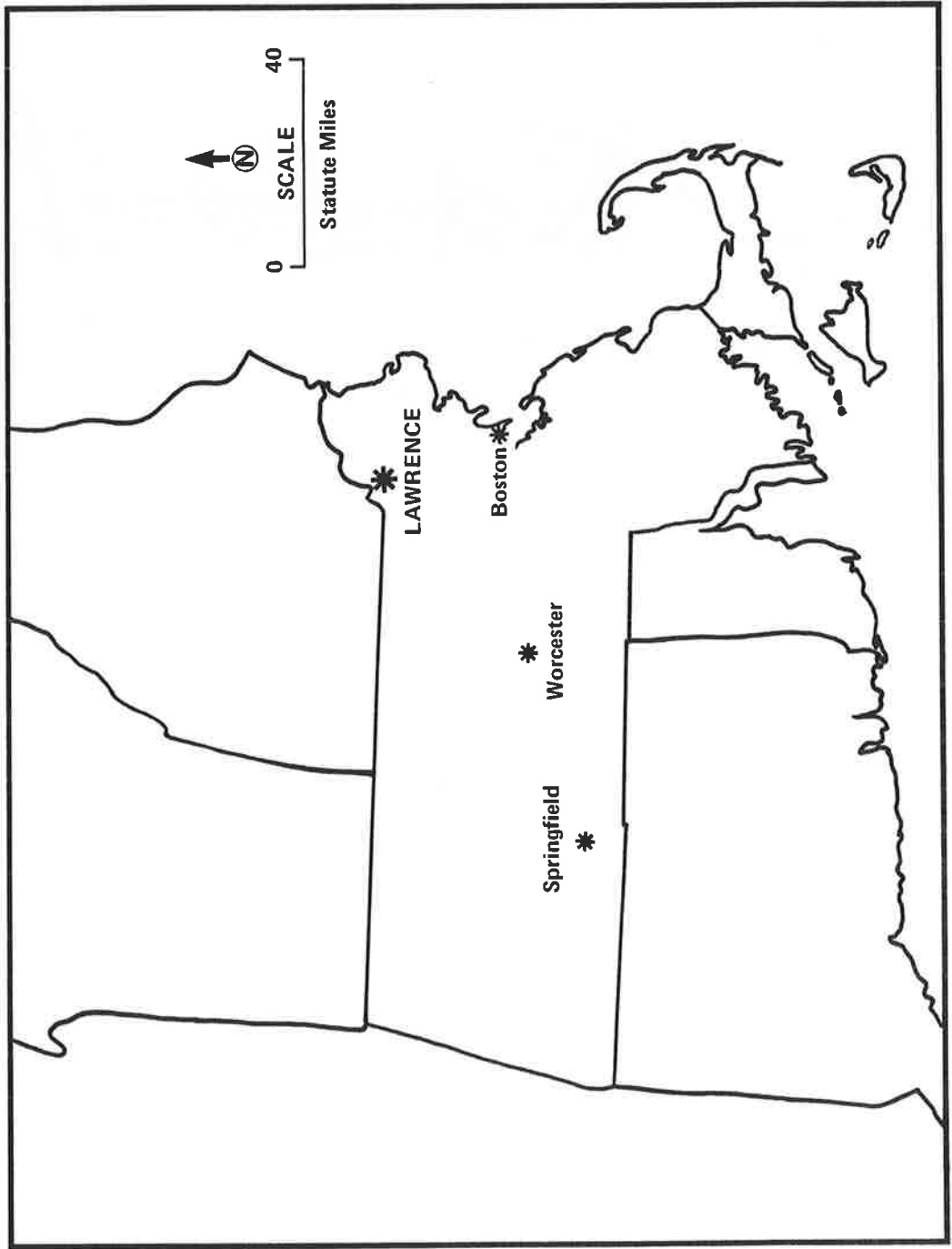


Figure 2-1. LOCATION OF LAWRENCE, MASSACHUSETTS



Figure 2-2. LAND-USE DISTRIBUTION IN LAWRENCE, 1968

2.1.1.2 Economic Base - Although no longer the home of a thriving textile industry as it was in the mid-nineteenth century, Lawrence is still a large commercial center. The manufacturing sector is the largest in the local economy, followed by the trade and service industries. The most important manufacturing outputs have traditionally been rubber, machinery, leather goods, and textile mill products, joined more recently by electronics components. Historically, the unemployment rate has typically fluctuated between 5.5 and 9.2 percent of the total work force.

2.1.1.3 Climate - The average January temperature in Lawrence is 21 degrees (Fahrenheit) and the average July temperature is 72 degrees. Prevailing winds are from the west, though an occasional east wind can bring a quick drop in temperature in the summer. Rainfall averages 42 to 46 inches annually. Precipitation is fairly uniform throughout the year, with snowfall generally occurring during any of the months between November and April.

2.1.1.4 Demographic Composition - Since the decline of the textile industry in New England, Lawrence's population has steadily decreased. Lawrence's 1970 population of 66,915 represented a drop of 5.7 percent from 1960 and a decrease of 29 percent since 1920. However, this trend appears to have been reversed in the 1970s. Lawrence's estimated 1978 population of 67,715 is approximately 1.2 percent above the 1970 level.

As shown in Table 2-1, Lawrence comprises a relatively small area, implying short intracity travel distances. Population density is high relative to that found in other urbanized areas.

Within Lawrence, there tend to be distinct geographical distributions for different demographic groups. The city's Spanish-speaking population (approximately 16.3 percent of the total population) is concentrated in the north part of Lawrence, while median family income tends to be highest in the southwest, northwest, and northeast corners (see Figure 2-3).

Of particular importance in this demonstration are the elderly and handicapped residents of Lawrence. According to the 1970 Census, 14.9 percent (9,970 individuals) of Lawrence's 1970 population was 65 years of age or older. The same




TABLE 2-1. CHARACTERISTICS OF LAWRENCE, 1970

<u>CHARACTERISTIC</u>	
Population	66,915
Area (square miles)	6.8
Density (persons per square mile)	9,840
Median Age	33.0
Age Distribution	
(percent below 18)	30.7
(percent above 65)	14.9
Median Years Schooling	10.4
Total Number of Households	16,892
Percent with Female Head	16.3
Percent with Own Children Under Six Years	24.0
Average Number of Persons per Household Unit	2.9
Central City Population	
(percent SMSA population residing in central city)	28.8*
Central City Retail Sales	
(percent SMSA retail sales in central city)	47.6*
Income (median family income, in dollars)	9,442
Income Distribution	
(percent below \$5,000)	20.3
(percent above \$15,000)	17.5
Number of Persons in Labor Force	30,165
Modal Split	
(percent of workers using public transit for work trip)	4.9
Auto Ownership	
(percent of households with one or more autos)	81.1
Growth Rate	
(percent change in population, 1960-1970)	-5.7

*Lawrence is situated in an SMSA with two central cities,
Lawrence and Haverhill.

SOURCE: U.S. Department of Commerce, Bureau of the Census,
1970 Census.



-  Greater Than 14.9% Elderly (city average)
-  Greater Than 10% Spanish-speaking
-  Median Family Income Less Than \$10,000 per Year (1970)
- G₁ = Public Housing
- G₂ = Private Nursing Home

- A₁ = Medical Facility
- A₂ = Social Service Agency
- A₃ = Social Service Agency Primarily Serving the Handicapped
- A₄ = Shopping Facility

Figure 2-3. GEOGRAPHICAL DISTRIBUTIONS OF POPULATION SUBGROUPS, AND LOCATIONS OF MAJOR TRIP GENERATORS AND ATTRACTORS FOR THE ELDERLY AND HANDICAPPED IN LAWRENCE

percentage applied to Lawrence's estimated 1978 population of 67,715 implies that there were 10,090 elderly individuals in Lawrence at the start of the project.

Within the city, the elderly tend to reside in the center of north Lawrence (see Figure 2-3). Although it might be inferred from the concentration of elderly and Spanish-speaking residents shown in Figure 2-3 that many of the elderly are Spanish-speaking, this is not the case in Lawrence. The Spanish-speaking population is relatively young, due to recent immigration, and shares the central part of north Lawrence with the predominantly older, non-Spanish-speaking population.

Figure 2-3 also shows the locations of various shopping facilities and medical centers, which are likely to be major trip attractors, in relation to the residential locations and concentrations of Lawrence's elderly population. Since several doctors' offices and shopping facilities have moved in the 1970s to the adjacent towns of Andover, North Andover, and Methuen, trips made by many elderly individuals may be longer than would otherwise be implied by the small geographical size of Lawrence. On the other hand, most of the elderly residents of Lawrence live within two miles of many social service agencies (A2) and Lawrence General Hospital (A1).

The 1970 Census also indicates that approximately 5.3 percent (3,535 individuals) of Lawrence's 1970 population consisted of nonelderly handicapped persons. The same percentage applied to Lawrence's estimated 1978 population implies that there were 3,589 nonelderly handicapped individuals in Lawrence at the start of the project.

Figure 2-3 shows the locations of two major trip attractors for handicapped individuals (A3). In addition, several of the trip attractors for the elderly also serve as major trip attractors for the handicapped.

Based on the estimates of the numbers of nonelderly handicapped and elderly individuals in Lawrence presented above, the total population of Lawrence that was eligible for the project in 1978 is estimated to be 13,679. It is noted that this figure may be a slight overestimate, since the Census definition of handicapped may be less restrictive than the criteria used to establish travel handicaps for project eligibility purposes (see Chapter 3).

2.1.1.5 Political/Institutional Environment - The City of Lawrence is governed by a strong mayoral form of government. The mayor is elected at-large and has overall fiscal responsibility for city government. Four aldermen are also elected at-large and are each responsible for administering one department of city government.

2.1.2 Exogenous Changes During Project

In order to distinguish the impacts of the user-side subsidy program from external, unrelated shifts, it is necessary to account for various changes in background conditions that occurred during the project. Exogenous influences may have effects similar to those of the subsidy program (e.g., on travel behavior) that could serve to invalidate conclusions drawn solely on the basis of "before and after" comparisons. External changes in site conditions that have the potential to influence observed project results are detailed below.

2.1.2.1 Economic Base - Various indicators of economic activity tend to show that there were no substantial changes in the aggregate economy of Lawrence during the demonstration. For example, total employment in Lawrence increased by approximately 1.3 percent between July 1978 and July 1979, and then declined by approximately 0.3 percent between July 1979 and July 1980. Similarly, the unemployment rate in 1979 was slightly lower than 1978 levels (7.2 vs. 7.7 percent), but increased again in 1980.

2.1.2.2 Climate - Temperatures remained fairly close to normal throughout the project period, with few exceptions. The month of February 1979 was colder than usual, with the average temperature over eight degrees below normal. Overall, precipitation also remained close to normal, although the winter of 1979-80 had less snow than usual, especially in the months of December, January, and February, when total monthly precipitation was at least two inches below normal.

2.1.2.3 Demographic Composition - While precise data are not available, it is believed by city planners in Lawrence that the total population of Lawrence may have declined slightly during the project, but that the percentage of elderly and handicapped residents increased (e.g., due to construction of specialized housing). Therefore, it is assumed that no significant net change occurred in the estimated number of individuals who were eligible for the project (13,679 - see above).

2.2 TRANSPORTATION CHARACTERISTICS

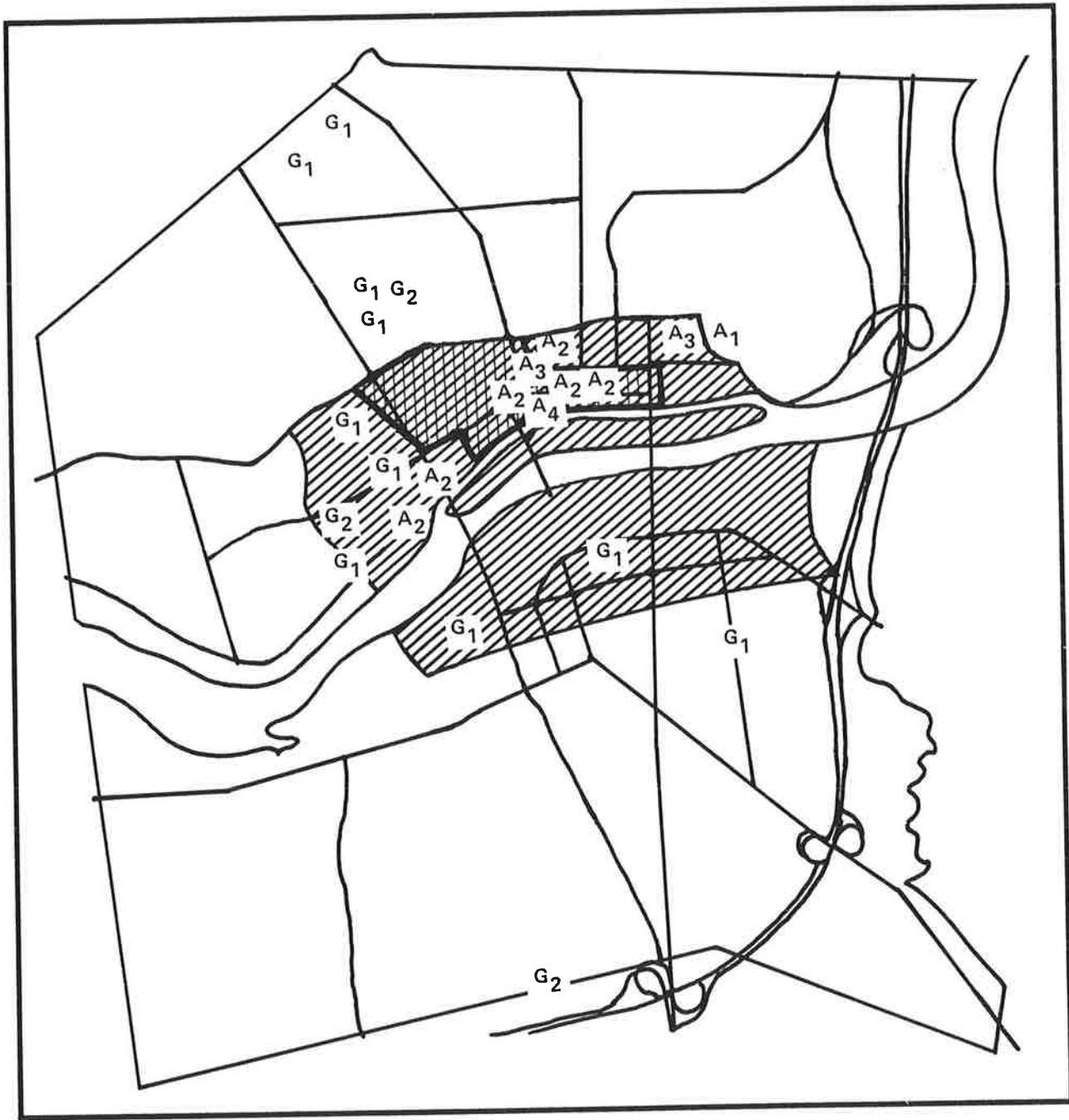
Public transportation in Lawrence is provided by both taxis and conventional fixed-route buses. In addition, a significant number of elderly and handicapped individuals obtain transportation services through social service agency programs.

The predemonstration characteristics of each of these service providers are presented below. Exogenous changes in these characteristics that took place during the demonstration are then summarized.

2.2.1 Predemonstration

2.2.1.1 Taxi - The Lawrence taxi code gives the city the authority to limit fares, and to require that each taxicab be separately licensed and meet basic safety requirements. Taxicab drivers must also be certified by the city. Under the code, fares were calculated using a zone system that divided Lawrence into two parts, a central zone and a surrounding outer zone, as shown in Figure 2-4. At the beginning of the demonstration, fares for travel within either zone were limited to a maximum of \$1.25. Fares for trips that traversed zonal boundaries were limited to \$1.50. Group rides (two or more adult passengers with the same origin and destination) were charged \$.50 per additional person. Wait-time charges were limited to \$7.00 per hour, but operators were able to set their own fees for trips that left the city.

The city controls entry to the taxi market by issuing permits for operation. Each permit allows the operation of one vehicle and can be acquired from the city for a total fee of



Zone 1

Zone 2

Central Business District

G₁ = Public Housing

G₂ = Private Nursing Home

A₁ = Medical Facility

A₂ = Social Service Agency

A₃ = Social Service Agency Primarily
Serving the Handicapped

A₄ = Shopping Facility

Figure 2-4. TAXI ZONE MAP

\$6.00. Private resale of permits is not allowed. At the beginning of the demonstration, the city taxi code limited the number of permits to 77. This number could only be changed through an amendment to the code.

At the beginning of the demonstration, Lawrence had a large number (ten) of relatively small taxi companies that held 76 permits and operated a total of 74 licensed vehicles (see Table 2-2). Vehicles are generally owned by the taxi company and provided to drivers in most cases under a contract wherein the firm and the driver split the revenues evenly. The driver is not considered an employee of the firm, but rather is more like a subcontractor, who can collect tips but must also pay for gasoline.

Eight of the ten taxi companies joined the demonstration at its beginning. Frenchy's Cab did not join because its operating hours (4:00 a.m. to 8:00 a.m.) were not conducive to elderly and handicapped ridership. South Union was not allowed to join because its owner was also an employee of the City of Lawrence, and there was concern on the part of city officials about the appearance of a conflict of interest.

For the eight firms that initially agreed to participate in the project, important characteristics that define the unique features of each firm's operations and provide a baseline for identification of any changes during the project are described below. These characteristics include the following:

- a. Vehicles and facilities;
- b. Staffing;
- c. Operating policies;
- d. Service policies; and
- e. Financial data.

This information is derived from interviews of taxi operators conducted in July 1978.

a. Vehicles and Facilities. Town Taxi had 14 vehicle permits and 8 cabs, dating from 1969 to 1973. In addition, Town also owned two vans, one of which was equipped with a wheelchair lift. The company had a dispatching office equipped with five telephones and an administrative office, as well as a seven-car garage equipped to perform most general repairs, though the facility had no lift.

TABLE 2-2. NUMBER OF VEHICLES AND PERMITS HELD
BY LAWRENCE TAXI FIRMS PRIOR TO DEMONSTRATION

<u>PARTICIPATING FIRMS</u>	<u>NUMBER OF PERMITS</u>	<u>NUMBER OF VEHICLES*</u>
Merrimack Taxi	8	10
Arrow Taxi	2	3
Town Taxi	14	10**
Plaza Cab	9	12
Central/Yellow Cab	14	12
Park Taxi	4	4
B&M Taxi	7	6
Alianza Taxi	4	4
Subtotal	<u>62</u>	<u>61</u>
<u>NONPARTICIPATING FIRMS</u>		
Frenchy's Cab	3	2
South Union Taxi	11	11
Subtotal	<u>14</u>	<u>13</u>
Total	76	74

*May exceed the number of permits due to spares.

**Includes two vans.

SOURCE: Interviews with taxi operators, July 1978.

Central/Yellow Cab held 14 permits and operated 12 cabs, dating from 1972 to 1978. Several of the vehicles were Checker cabs, which were large enough to accommodate a wheelchair with little difficulty. Central/Yellow had a one-room office and access to a fully equipped garage (operated by a relative of the owner).

Plaza Cab had 9 permits and 12 cabs, 3 of which were kept in reserve. The vehicles dated from 1966 to 1973. Plaza had a dispatch/waiting room, in addition to four administrative offices shared with branches of an auto-repair business also operated by the cab owners. All cab maintenance was done at these fully equipped service garages.

B&M Taxi held 7 permits and operated 6 cabs, ranging in vintage from 1975 to 1977. The company had a very large one-room office. This office was equipped with two telephone lines, and also served as a storage area for maintenance equipment.

Park Taxi had 4 permits and 4 cabs, which were 1971 and 1972 model years. Park had a one-room office and a mechanic available for routine work, although large repair jobs were contracted out.

Merrimack Taxi had 8 permits and 10 cabs, dating from 1971 to 1976. The office consisted of a waiting room and a dispatching room, and was located in the owner's house. The company had a two- to three-car garage and a mechanic available.

Alianza had 4 permits and 4 vehicles dating from 1970 to 1973. The company had a one-room office and no maintenance capabilities. This firm had only been in operation since April 1978.

Arrow held 2 permits and owned 3 vehicles dating from 1972 to 1973. Arrow had no office and no maintenance facilities.

The participating taxicab companies in Lawrence all had base dispatching radios and radio-equipped cabs, with the exception of Arrow Taxi, which operated directly out of a store/diner operated by the owner. None of the cabs were equipped with meters since Lawrence uses a zone system to calculate fares. As noted above, only Town Taxi had a vehicle equipped with a wheelchair lift.

b. Staffing. All participating firms, with the exception of the small Arrow Taxi Co., employed a full-time dispatching staff in addition to the drivers needed to operate their cabs. Most also employed at least some clerical and maintenance support personnel.

In general the office and support staff arrangements in Lawrence taxi firms are very flexible. Owner/managers are generally the most versatile staff members and are often found filling in as drivers, dispatchers, or as bookkeepers/clerks. Many have family members or relatives acting as support staff. A summary of the staffing arrangements of the participating Lawrence taxi companies is presented in Table 2-3.

c. Operating Policies. Operating policies include special fares, dispatching hours, operating hours, and the method of assigning trips to drivers. Under the city taxi code, there existed some flexibility in fares, since the code only provided an upper limit on fares. This meant firms could compete by setting their fares lower than those of the other firms.

Several firms took advantage of this flexibility. Merrimack charged \$.25 less per zone than the regulated fare. They also offered a flat rate of \$1.00 for subscription rides and service for school children. Central/Yellow also offered some special flat rates. Park offered a \$.25 discount for senior citizens, and Town offered a 20 percent discount to elderly (60 or over) and handicapped riders.* Since rides outside the city limits were not regulated, the rates set by the taxi companies for these rides were also competitive, varying on average from \$.70 to \$.90 per mile.

Three of the participating cab companies, Town, Plaza, and B&M, operated 24 hours per day, seven days per week. Central/Yellow, Park, and Alianza operated 18 hours per day, from 6:00 a.m. to 12:00 p.m., seven days a week. Merrimack operated from 4:30 a.m. to 12:00 p.m. while Arrow operated from 5:00 a.m. to 9:00 p.m., both of them seven days a week.

The participating operators all assigned telephoned service requests to the nearest available cab, using a driver rotation as a deciding factor when more than one cab appeared

*Arrow also offered discounts to elderly and handicapped riders, but only on an intermittent, as-needed basis.

TABLE 2-3. STAFFING PROFILE OF PARTICIPATING
LAWRENCE TAXI COMPANIES

Town Taxi	12 drivers 2 dispatchers 1 manager (also dispatcher & driver) 1 mechanic (part-time) 1 bookkeeper
Central/Yellow	18 drivers 3 dispatchers 1 manager/dispatcher
Plaza	40 drivers 4 dispatchers (full-time) 4 dispatchers (on-call) 1 secretary 1 manager/dispatcher
B&M	12 drivers 1 dispatcher (full-time) 1 dispatcher (part-time) 1 manager/dispatcher
Park	9 drivers 1 dispatcher 1 manager/dispatcher/driver 1 mechanic 1 night watchman
Merrimack	15 drivers 1 dispatcher 1 mechanic 1 manager/dispatcher
Alianza	4 drivers 1 dispatcher 1 manager/driver/dispatcher
Arrow	1 driver (full-time) 1 driver (part-time)

SOURCE: Taxi operator interviews, July 1978.

to be a reasonable selection for handling a given service request. A summary of the preproject operating policies of the participating Lawrence taxi firms is presented in Table 2-4.

d. Service Policies. Service policies include company approaches to subscription service, reservation service (time calls), and market segmentation, as well as marketing strategies and special policies directed toward elderly and handicapped users. The participating taxicab companies all obtained a very high percentage of their business over the phone, although Town and Central/Yellow estimated nearly 40 percent of their business was from walk-in customers (both of their offices were located in the central business area). Town and Park also indicated much of their business was on a subscription basis, although they did not know what percentage of their total business it was. In general, subscription service and reservation service were well established practices in Lawrence before the demonstration. Only Alianza and Central/Yellow reported no subscription service, and only Park estimated its reservation service to be very slight.

Exact ridership statistics are not available, though most firms indicated that ridership was seasonal, with higher usage occurring in the colder, winter months. B&M estimated ridership to be about 300 per day, the highest of all the participating firms. Town, Plaza, and Merrimack averaged about 250 trips per day. None of the participating firms were certain of the mileage accumulated by their fleets, likely due to the fact that fares are calculated using the zonal system and mileage does not have to be considered. B&M estimated that mileage averaged between 100 to 150 miles per car per day, while Plaza estimated only 42 miles.

Prior to the demonstration, Central/Yellow held two contracts with Methuen Welfare, Plaza held a contract with a local business organization, and B&M held a contract with two local hospitals to transport blood. Town Taxi held two special service contracts for transporting the handicapped. One was with the City of Lawrence to provide service to special needs children. The other contract involved transporting Medicaid patients on a reimbursement basis with sponsoring agencies. Aside from these contracts and the fare discounts offered by Park and Town (described above), none of the other companies were involved with programs designed specifically for elderly

TABLE 2-4. SUMMARY OF BEFORE-PROJECT OPERATING POLICIES

Firm	Operating Hours	Dispatching/ Method of Assignment	Driver Deployment	Fare Policies		Special Policies
				Wait Time	Outside City	
Town	24 hrs. 7 days/week (5AM-12PM in summer)	Proximity first, then driver rotation	Hours set by drivers	\$7.00/hr.	\$.90/mile	Van trips: o Medicaid chair car trips - \$14/one-way (under 5 mi.) o Regular group trips - \$10-15/hr. o 20% discount for E&H (60 or over) Some flat rates offered
Central/ Yellow	6AM-12PM 7 days/week	Proximity only; some rotation on out-of-town trips	6AM-6PM: 8 cabs 12AM-6PM: 4 cabs 6PM-12PM: 4 cabs	\$9.00/hr.	\$.90/mile	
Plaza	24 hours 7 days/week	Proximity first, then driver rotation	Set by drivers	\$16.00/hr.	\$.80/mile	
B&M	24 hours 7 days/week	Proximity first, then rotation. Rotation always on out-of-town trips of \$15 or more	6AM-1AM: 6 cabs 1AM-6AM: 1 cab	\$7.00/hr.	\$.80/mile	
Park	6AM-12PM 7 days/week	Proximity only	6AM-6PM: 4 cabs 5PM-Mid.: 3 cabs (part-time)	\$6.00/hr.	\$.70/mile	\$.25 discount for Sr. Citzns. \$25 flat fare to Logan Airport
Merri- weck	4:30AM- 11/12PM 7 days/ week	Proximity first, then rotation	5:30AM-1PM: 3 cabs 5:30AM- 6/7PM: 4 cabs 2/3PM- 11/12PM: 3 cabs	\$7.00/hr.	\$.75-\$.80 per mile	Charges \$.25 less per zone than stated fare \$1.00 flat fare for school children or subscription rides
Allianza	6AM-11/12PM 7 days/week	Proximity first, then rotation	6AM-2/3PM: 2 cabs 2/3PM-11PM: 2 cabs	N/A	N/A	Flat fare to many places outside city
Arrow	5AM-9PM 7 days/week	Return to base; no radio or dispatch	8AM-6PM: 1 cab 8AM-6PM: 1 cab (as needed)	\$7.00/hr.	N/A	As above

SOURCE: Taxi operator interviews, July 1978.

and handicapped people. However, all of the firms carried wheelchairs at least occasionally and often helped elderly people with doors and packages.

No significant market segmentation existed in Lawrence prior to the demonstration. Elderly people comprised a significant percentage of ridership for all the companies. However, because of the concentration of Spanish-speaking population within part of Lawrence, communications problems had caused three firms (Park, Merrimack, and Alianza) to become the principal taxi service providers for the hispanic community. These three firms are located in areas heavily populated with hispanics, and have a large number of Spanish-speaking drivers. However, all companies indicated that they would carry anyone who called for service.

Most of the operators had very limited marketing efforts. All of the companies, with the exception of Arrow, advertised in the Yellow Pages, and Town, Central/Yellow, B&M, and Arrow advertised in local police bulletins and banquet books. Plaza infrequently advertised on the radio and also was the only company to have a direct telephone line, located at a shopping plaza. Merrimack operated a weekly lottery that involved giving tickets to all its riders, and giving away houseware items as prizes.

e. Financial Data. No specific financial data are available for any of the companies. Overall, however, the Lawrence taxi industry appeared to be financially healthy and viable prior to the demonstration.

2.2.1.2 Transit - Trombly Motor Coach, a private bus line, began providing transit service in Lawrence in 1969 when the Massachusetts Bay Transportation Authority (MBTA) ceased its operations in the area. When Trombly experienced financial difficulties in 1977, Lawrence and the neighboring communities of North Andover and Methuen contracted with the Merrimack Valley Regional Transit Authority (MVRTA) to obtain financial assistance for the transit service.

Before the demonstration, the one-way fare was \$.30. Anyone wishing to make a transfer to another bus had to pay an additional full fare. Students using transit service paid a cash fare of \$.20 or used a student ticket purchased for \$.20 from local schools. Elderly (i.e., 60 years of age or older) or handicapped persons paid a one-way fare of \$.15. This half-fare policy was in effect during the entire service day.

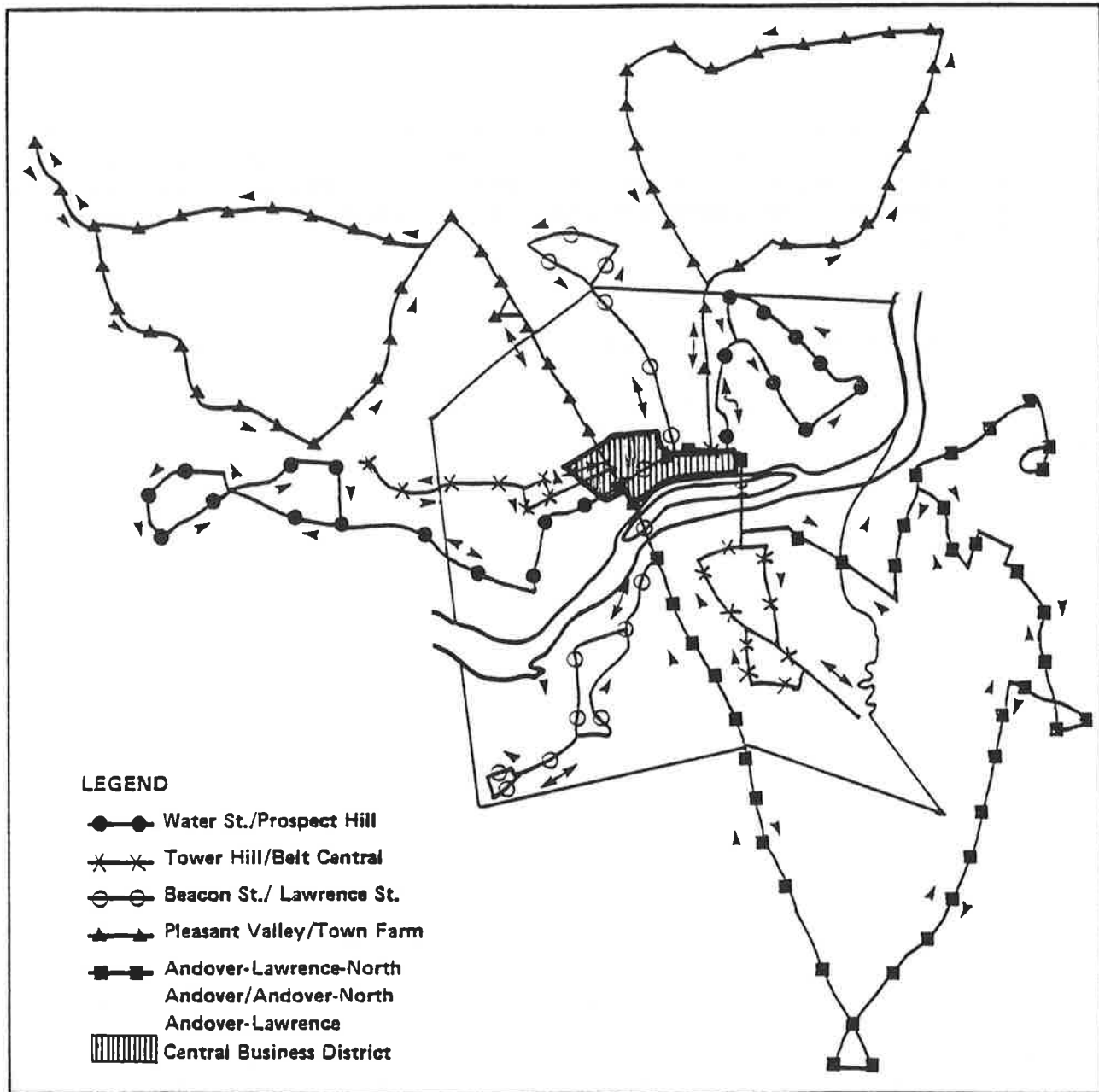
Important characteristics that describe the transit service and provide a baseline for identification of any changes during the project are described below. These include the following:

- a. Equipment;
- b. Operating policies;
- c. Marketing;
- d. Ridership; and
- e. Financial data.

a. Equipment. Trombly utilized 10 General Motors Model 4516 buses for its transit operations in the Lawrence metropolitan area. Seven of these vehicles were in operation on any given weekday. The buses were 1961 vintage and seated 38 passengers. They had no special characteristics such as lifts or air conditioning. In addition to these vehicles, Trombly maintained a fleet of 35 school buses, 42 motor coaches, and 3 pick-up trucks for its multifarious transportation operations.

b. Operating Policies. Service was provided 6 days a week, Monday through Saturday. No service was provided on Sundays or generally observed holidays. On weekdays all routes were operated at least 9 hours and 45 minutes, with some lines operating nearly 13 hours. Basic service hours were 5:30 a.m. to 6:00 p.m. On Saturdays, service hours were reduced substantially.

Prior to the demonstration, buses originated from a number of outlying locations, and ran to and through downtown Lawrence, as shown in Figure 2-5. Although each segment of the line between Lawrence and each outlying location had its own destination, pairs of segments were often served by one bus and considered as a single route. Weekday headways on all lines were one hour. On Saturdays, these headways increased to two



SOURCE: Merrimack Valley Planning Commission, *Merrimack Valley Transit Study: A Progress Report* (Haverhill, Mass.: March, 1978), p. 12.

Figure 2-5. LAWRENCE AREA BUS SYSTEM ROUTE MAP

hours on approximately half of the routes, and some routes were consolidated. Overall, Saturday operations represented approximately 50 percent of weekday levels.

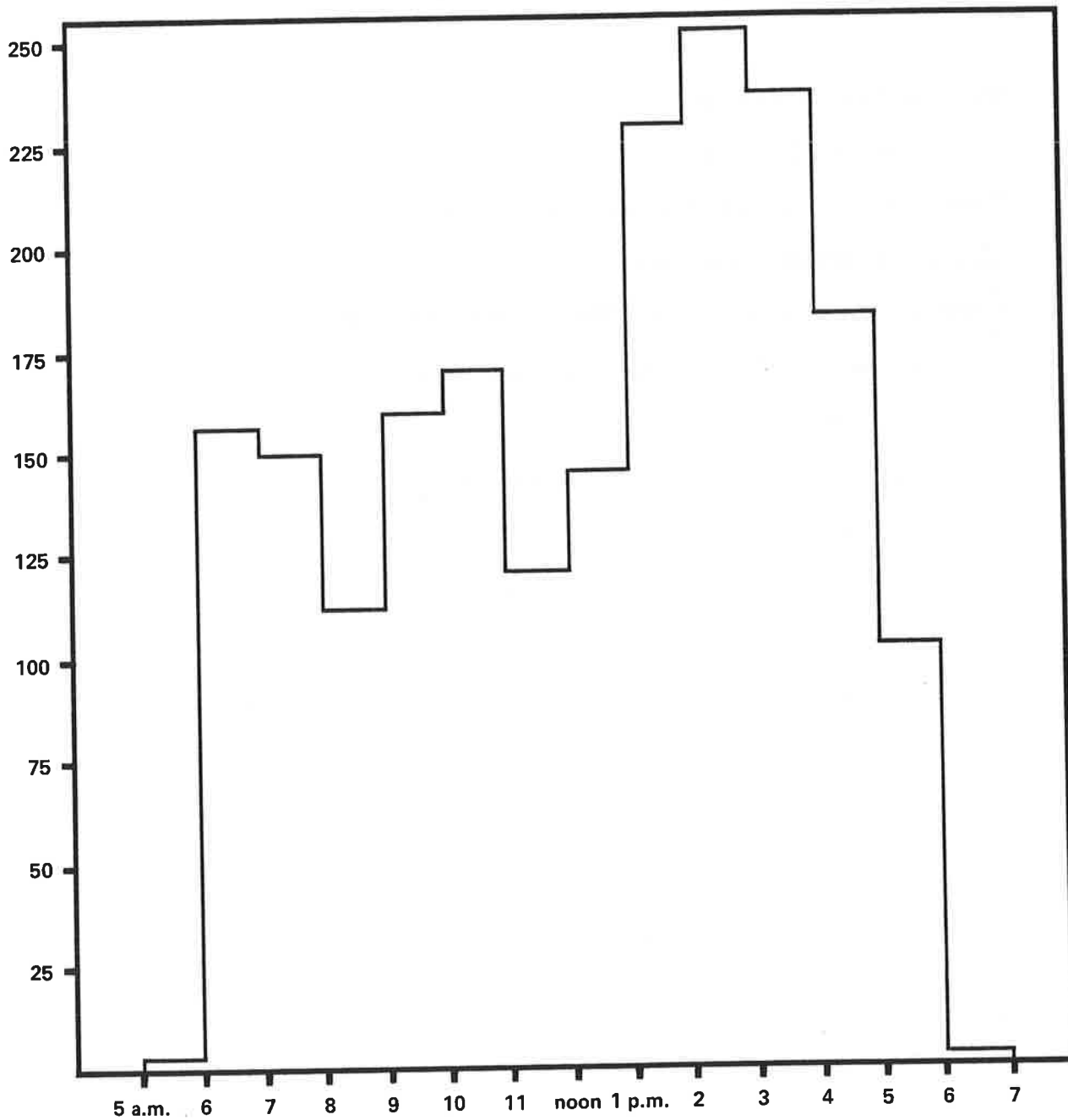
c. Marketing. Trombly's major marketing activities were printing three different bus schedules and offering a telephone information service. To enhance the marketing of the Lawrence transit system, the MVRTA instituted a marketing program as part of its management responsibilities. The publication of a route map of the Lawrence transit system was its first major effort.

d. Ridership. Prior to the demonstration, weekday average ridership for the system was nearly 1,900 riders, while Saturday ridership was between 1,100 and 1,200 riders.* As shown in Figure 2-6, peak ridership hours were between 1:00 p.m. and 4:00 p.m.

e. Financial Data. During the month of June 1978, Trombly collected approximately \$10,000 in revenues. Revenues averaged \$.38 per bus revenue mile and \$3.36 per revenue vehicle hour. The total operating cost was \$67,670 for the sample month, yielding a substantial operating deficit. The majority of these losses were made up through Federal grants obtained under Section 5 of the Urban Mass Transportation Act of 1964, as amended, and state and local matching funds obtained from the MVRTA.

2.2.1.3 Social Service Agency Transportation - To a limited extent, specialized transportation services for the elderly and handicapped were available prior to the demonstration through the programs of social service agencies. A total of 14 agencies provided social services in Lawrence prior to the demonstration, the six largest of which were selected for detailed investigation (see Table 2-5). These agencies tend to be located in areas with higher concentrations of elderly residents (see Figure 2-7), although they encompass a broad range of activities and clients (see Appendix B, Table B-1).

*Data drawn from sample week in March 1978.



SOURCE: Data drawn from counts taken during week of October 3-7, 1977 by MVRTA.

Figure 2-6. AVERAGE WEEKDAY RIDERSHIP BY TIME OF DAY FOR LAWRENCE TRANSIT SYSTEM

TABLE 2-5. LAWRENCE SOCIAL SERVICE AGENCIES
WITH ELDERLY AND/OR HANDICAPPED CLIENTS

American Cancer Society

*Department of Public Welfare

*Elder Services of the Merrimack Valley, Inc.

F.I.S.H. of Greater Lawrence

*Greater Lawrence Chapter of the National Red Cross

*Greater Lawrence Mental Health Center, Inc.

Home Health Services

Jewish Family Service of Greater Lawrence

*Lawrence Council for Aging

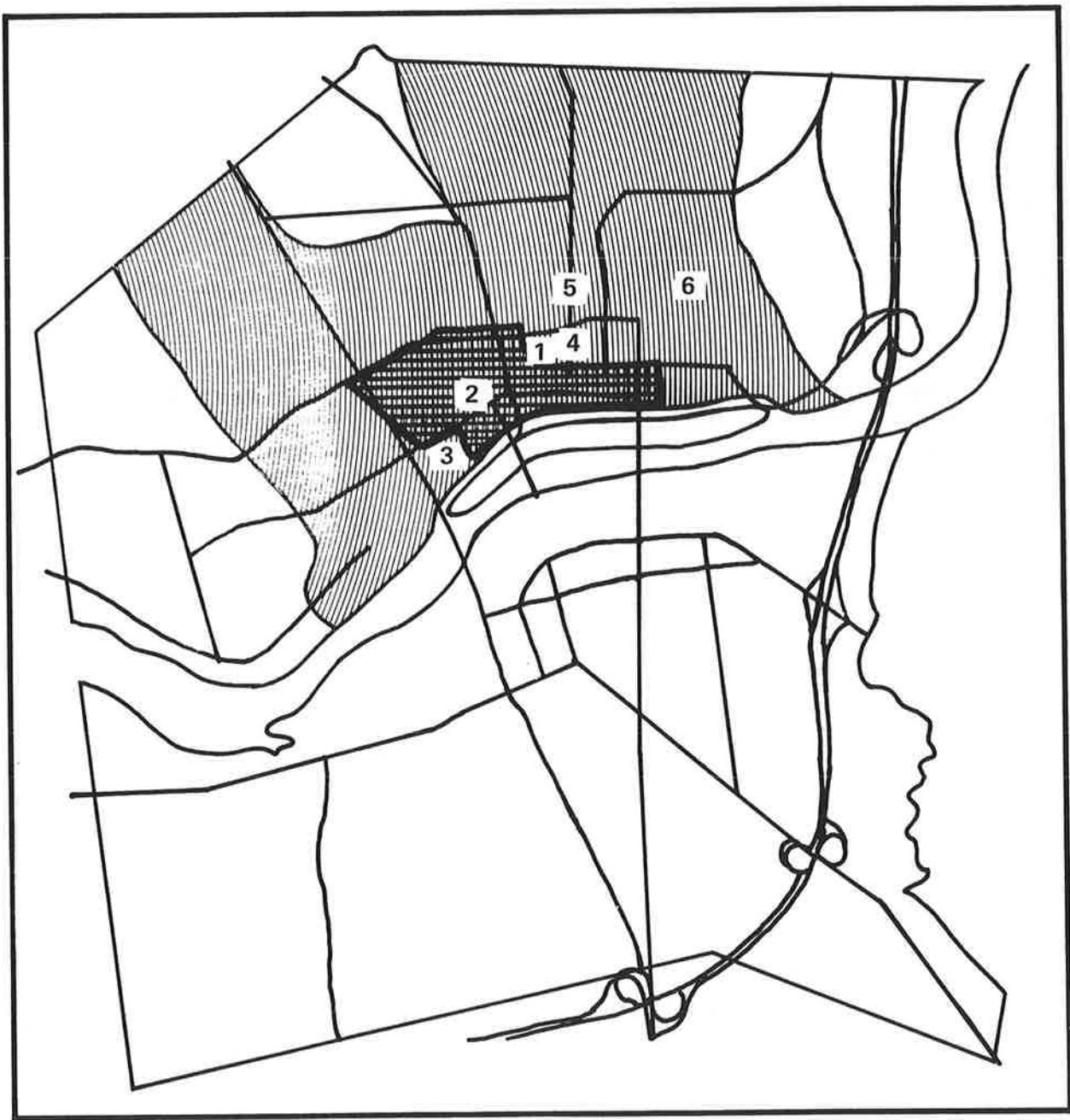
*Lawrence General Hospital Rehabilitation

Meals on Wheels

R.S.V.P. (Greater Lawrence Retired Senior Volunteer Program)

Social Security Administration

*Selected for detailed investigation.






- | | |
|---|---|
|  Greater Than 14.9% Elderly (city average) |  Less Than 14.9% Elderly |
| 1. Department of Public Welfare |  Central Business District |
| 2. Elder Services of the Merrimack Valley, Inc. | |
| 3. Greater Lawrence Chapter of the National Red Cross | |
| 4. Greater Lawrence Community Action Council | |
| 5. Lawrence Council on Aging | |
| 6. Lawrence General Hospital Rehabilitation | |

Figure 2-7. LOCATION OF SAMPLE SOCIAL SERVICE AGENCIES AND THE ELDERLY IN LAWRENCE, MASSACHUSETTS

Before the demonstration, a limited number of transportation services were provided by these six agencies (see Appendix B, Table B-2). The largest provider of specialized transportation services was the Lawrence General Hospital Rehabilitation Center, operating three 60-passenger buses, two 9-passenger vans (one of which was lift-equipped), and three 6-passenger station wagons. The vans provided demand-responsive door-to-door service with a 24-hour advance reservation requirement, while the buses operated on a regularly scheduled fixed-route basis.

Elder Services of the Merrimack Valley operated no vehicles of its own but contracted for service from the Greater Lawrence Community Action Council, which operated two vans, one of which was lift-equipped. The Community Action Council also contracted for service with the Lawrence Council on Aging, which operated three station wagons. The Greater Lawrence Chapter of the National Red Cross operated a transportation program with two 9-passenger station wagons. The Department of Public Welfare had no vehicles, but reimbursed its clients for taxi and bus service.

Eligibility requirements for transportation service usually were similar to the requirements for primary agency services. Generally, the people served by agency transportation had low incomes and were traveling for medical purposes. Other major trip purposes were for special programs or workshops, and shopping. Overall, the six agencies served some 540 one-way trips per week, only a third of which were within the City of Lawrence. This was because the service area for at least three of the six agencies encompassed the four-city area of Lawrence, Methuen, North Andover, and Andover, while the service areas of two other agencies encompassed most of the communities in northeastern Massachusetts.

The costs to the agencies of providing these transportation services varied greatly depending on the type of service offered. For example, the average cost of a medical trip taken by taxi and reimbursed by the Department of Public Welfare was \$25.00 in comparison with the fixed-route bus service provided by the General Hospital Rehabilitation Center for \$1.90 per trip. The Rehabilitation Center was also the only agency that defrayed its transportation costs through user charges.

2.2.2 Exogenous Changes During Project

2.2.2.1 Taxi - During the demonstration project, a number of changes occurred in the taxi industry concerning both the level of fares and the number of taxi companies in operation. A fare increase of \$.25 per zone was granted in July 1979, so that maximum fares for trips within Lawrence ranged from \$1.50 to \$1.75. Additional charges for extra riders remained at \$.50.

In 1978, Frenchy's Cab was bought by Plaza Cab, reducing the number of cab companies to nine. In January 1979, the owner of South Union retired from his job with the city, making his firm eligible to participate in the demonstration project, which it joined immediately. As of January 1979, all nine licensed taxi firms in Lawrence were participating in the demonstration. A description of the new firm and exogenous changes in the characteristics of the other, preexisting firms are presented below.*

a. Vehicles and Facilities. When it joined the project, South Union held 11 permits and owned 9 cabs, 2 cabs fewer than it had before the demonstration. The company had a small one-room office and no maintenance facilities except an open lot available for minor repair work.

When Plaza purchased Frenchy's, it increased its number of permits from 9 to 12, and added 2 vans (neither of which were lift-equipped) to its fleet. Plaza moved its headquarters to new facilities, only a short distance away from its old offices, but closer to a new home for the elderly. The new facility included a waiting room/dispatch office equipped with 5 phone lines. Outside the building is space for parking.

None of the other cab companies made major facility changes, but a small number of changes did take place in the numbers of vehicles and permits held by the taxi companies. These changes are described in detail in Chapter 6.

b. Staffing. South Union employed 2 full-time and 3 part-time drivers, 3 drivers fewer than before the demonstration began. During the demonstration B&M added

*Drawn from taxi operator interviews, August 1979.

3 drivers. Alianza decreased its staff by 1 driver and Merrimack decreased its staff from 15 available drivers to 5 full-time drivers and 2 part-time drivers. Plaza decreased its dispatching staff by one full-time and one part-time dispatcher.

c. Operating Policies. South Union operated seven days per week, from 5:30 a.m. to 1:30 a.m. This firm assigned trips in a manner similar to other firms (i.e., it generally dispatched the nearest cab to telephoned service requests). This firm received only 5 percent of its business from walk-ups, obtaining most of its business over the telephone.

d. Service Policies. Subscription service and reservation service practices among the initial participating firms did not change appreciably during the demonstration. South Union offered subscription service to school children and workers at a local electric company. South Union advertised primarily in the Yellow Pages and served anyone who called or walked in.

e. Financial Data. Accurate financial data for the individual companies continued to be unavailable during the demonstration. However, it is known that fares, revenues, and operating costs increased during the demonstration. The most obvious of the increases was in the price of gasoline, which increased dramatically during 1979 and 1980 to a level of well over \$1.00 per gallon. Other operating costs also increased significantly, including wages to dispatchers, auto parts, and maintenance fees.

Any or all of these changes in the operating characteristics of taxi firms in Lawrence had the potential to affect the same transportation system indicators as the demonstration, and therefore might play an essential role in the interpretation of changes observed after the beginning of the project.

2.2.2.2 Transit - During the demonstration project, there were relatively few changes in the transit system. The changes that did occur are described below.

a. Marketing. The MVRTA received a grant to install bus stop signs and shelters. At the time, bus stop signs were present only in the downtown area. The plan was to place them throughout the entire city, eight signs per mile, on both sides of the street. It was planned that shelters would be built in places with high boarding activity or elderly usage. The MVRTA also published a route map of the Lawrence transit system and distributed 10,000 copies.

In August 1979, a group of merchants from Lawrence and the neighboring community of Haverhill began a marketing program with the MVRTA called "Have-A-Ride." As part of this program, participating banks and merchants gave away coupons worth a free bus ride to their customers who purchased merchandise totaling \$2.00 or more or who made any kind of transaction at a bank. The MVRTA later billed the merchants after the tickets had been used to pay for rides.

b. Operating Policies. During the demonstration, the transit routes in Lawrence were altered slightly. To facilitate traffic movements in the central business district, two parallel streets were changed from two-way to one-way traffic flows. This necessitated minor changes in bus routes and caused a transfer location to be moved to a point directly in front of the TRANSFARE office.

2.2.2.3 Social Service Agency Transportation - During the demonstration, the Department of Public Welfare attempted to cut back on its transportation costs by urging its clients to take less expensive forms of transportation (bus, a friend's car, etc.) rather than taxi, and by allowing fewer trips to be taken.

3. DEMONSTRATION IMPLEMENTATION AND OPERATIONS

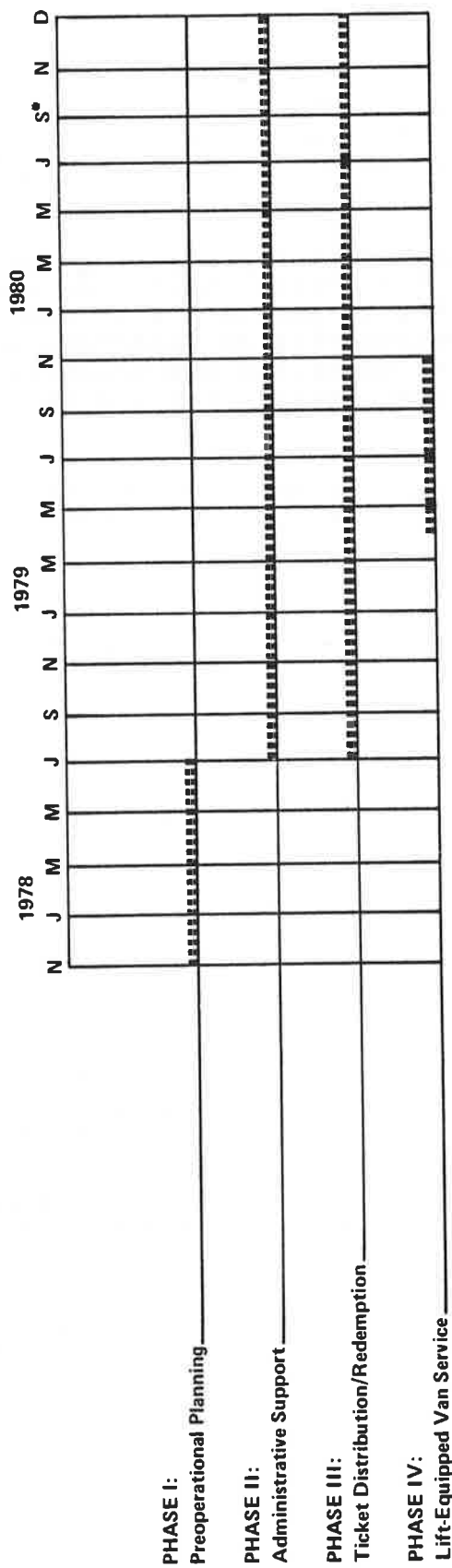
In this chapter, the administrative activities undertaken as part of the demonstration project are outlined. Demonstration project administrative activities can be classified into four distinct types, or phases: preoperational planning, administrative support, implementation of the taxi and bus ticket distribution/redemption systems, and implementation of the lift-equipped van service (see Figure 3-1). In the following section, specific activities in each of these phases are described in detail. The costs of these activities are then summarized, and the transfer of funding responsibility for the project in the post-demonstration phase to the Merrimack Valley Regional Transit Authority (MVRTA) is described.

3.1 ADMINISTRATIVE ACTIVITIES

3.1.1. Phase 1. Preoperational Planning

The preoperational planning phase began in November 1977* and was expected to last six months, with the formal start-up of the taxi and transit discount programs scheduled to take place on April 1, 1978. During this period prior to the initiation of the service, the project staff was organized. The Lawrence Administrator of Community Development was officially responsible for the implementation of the demonstration project. However, a planner in that department, designated as the Project Manager, supervised the project staff, which consisted of a transportation planner, cashier, project secretary/bookkeeper, temporary clerks, and interviewers. These individuals were assisted by a small number of other city employees. The specific responsibilities of each of these individuals are outlined below.

*Prior to formal initiation of the preoperational planning phase in November 1977, other administrative activities were undertaken in support of the Urban Mass Transportation Administration (UMTA) demonstration grant application process. These activities included changing the Lawrence taxi ordinance to allow shared riding without the permission of the first passenger (as described in Chapter 1). No noteworthy problems or obstacles were encountered in carrying out these tasks, and the project appeared to be generally well received.



*Financial responsibility for project assumed by Merrimack Valley Regional Transit Authority (MVRTA).

Figure 3--1. LAWRENCE USER-SIDE SUBSIDY DEMONSTRATION PROJECT--
TIME SCHEDULE

PROJECT STAFF

1. Project Manager -- reported to the Mayor and City Council on the project's progress, maintained budgetary control, hired new project personnel, supervised other project staff, prepared reports to UMTA, and coordinated project activities with other city departments.
2. Project Planner -- responsible for processing taxi and bus tickets and van vouchers for reimbursement, maintaining project records, responding to complaints of registrants and service providers, maintaining an inventory of project supplies, coordinating the marketing and promotion of the project, and performing other duties related to day-to-day operations.
3. Cashier -- assisted in ticket reimbursement process, sold ticket books to registrants, and conducted registration interviews.
4. Project Secretary/Bookkeeper -- responsible for project-related secretarial duties, maintaining project bills and disbursements, selling ticket books, and assisting in project promotion.
5. Interviewers -- conducted data collections supporting evaluation efforts beyond the scope of normal project administration (see Appendix A), and assisted in the registration process during the first month of project operation.

PARTICIPATING CITY EMPLOYEES

6. Purchasing Agent -- reviewed all purchase orders for equipment and supplies.
7. Auditor -- conducted audits of project operations for financial statements provided to UMTA and later to the Merrimack Valley Regional Transit Authority (MVRTA).
8. Treasurer -- processed project bills and subsidy payment checks, and maintained financial records and accounts for the project.
9. City Clerk -- responsible for the solicitation, evaluation and awarding of technical assistance and data collection contracts.

In January 1978, the Director of Community Development resigned after a new mayor was sworn in to office. A new director was to be appointed in mid-February, and, because it was expected that he would need time to become familiar with his new responsibilities, the scheduled project start-up date was postponed one month to May 1.

It was subsequently discovered that initial planning for the bus ticket distribution phase of the project had been based on incorrect assumptions concerning the bus fare level (the fare was assumed to be 20¢ when in fact it was 15¢). The original plan had been to use the same tickets (25¢ denomination) for payment of both taxi and bus fares. Under this plan, the registrant would pay 12 1/2¢ for each 25¢ ticket, and could then use one ticket to pay for a 20¢ bus fare, thus receiving a 7 1/2¢ subsidy. However, when it was discovered that the fare for elderly and handicapped riders was 15¢ and not 20¢, it was decided that few people would bother to buy tickets if they were to receive only a 2 1/2¢ discount. The ticket distribution plan was then changed to include two different kinds of ticket books, one for taxi, in which the tickets were in 25¢ denominations, and another for bus, in which each ticket cost 1¢ and was valid for the 15¢ fare (giving the registrant a 14¢ discount). It was felt that a charge of some sort should be imposed for the bus tickets to avoid creating the image of a charity for the program, and to induce users to keep track of their tickets with greater care.

Another delay was caused by some taxi service providers who were reluctant at first to sign contracts to participate in the program because of their apprehension about the reimbursement process and in having to work with municipal administrators. Also, the signing of the transit provider contract, which entailed obtaining 13(c) labor approval of the project, incurred additional delays. All of the necessary contracts were finally signed by mid-June, and the project was able to begin operations late in July.

In the nine months preceding the commencement of subsidized service, a variety of planning activities were undertaken. These included developing eligibility criteria and registration procedures; designing and obtaining identification cards for project users; establishing procedures for ticket distribution to registrants and ticket processing as well as reimbursement for participating taxi and transit operators; designing a publicity and outreach program; identifying a local registration site; and establishing procedures for reporting

and investigating complaints, monitoring ticket usage, and organizing monthly ridership data. The administrative policies and procedures resulting from this planning effort are described in the following sections.

3.1.2 Phase II. Administrative Support

A variety of administrative activities were undertaken to provide indirect support for the implementation and operation of the subsidy program. These activities, which can be subdivided into project registration/monitoring and program promotion, are described in detail below.

3.1.2.1 Project Registration/Monitoring - Eligible individuals were required to register with the program in order to benefit from the subsidy. To be eligible, a person had to be a resident of the city of Lawrence, and be at least 65 years of age and/or handicapped*. Registration, which took place in the program office, consisted of a brief personal interview to ensure that the eligibility criteria were met. Registrants were then given a photo identification card that entitled them to purchase taxi tickets valid for payment of taxi fares for half of their face value, or to purchase transit tickets with a value of \$.15 for \$.01 each (see Figure 3-2).

To protect the project from unauthorized resale of tickets and high subsidy costs caused by excessive use, individuals could only use the taxi service for four one-way or two round trips per week, and tickets were only to be used up to a fare of \$2.50. Any fare exceeding this limit was to be paid by the individual in cash. (This limit was raised to \$2.75 following the fare increase of \$.25 in July 1979.) After the first few months of the demonstration, individuals were also limited in the number of discount tickets they could purchase at any one time. Under the purchase limit, an individual could only purchase two transit ticket books and four taxi ticket books at any one time. The project staff maintained records of purchases made by registrants in chronological order. Unfortunately, this method of recording made it very difficult for the project staff quickly to identify previous purchases made by specific individuals, and so it was not possible for the project staff to closely monitor every registrant's project usage rate.

*"Handicapped" was defined according to specific criteria established by the program (see Appendix C for definitions).

PHOTOGRAPH	CITY OF LAWRENCE TRANSFARE PROGRAM
	ID# _____
	NAME _____
SIGNATURE _____	

25 CENTS	City of Lawrence Comm. Dev. Dept. Transfare Program	000004
	TAXI	
NATIONAL TICKET CO., SPRINGFIELD, ILL.		

1 RIDE	City of Lawrence Comm. Dev. Dept. Transfare Program	000004
	BUS	
NATIONAL TICKET CO., SPRINGFIELD, ILL.		

Figure 3-2. SAMPLE IDENTIFICATION CARD AND BUS AND TAXI TICKETS

3.1.2.2 Program Promotion - Program promotion entailed a variety of administrative activities undertaken to facilitate the implementation and acceptance of the project. For example, taxi drivers had to be instructed in the handling of project tickets (see Phase III, below). Also, project-related information was often requested by registrants and potential registrants over the telephone.

Overall, however, the largest component of program promotion involved marketing and outreach activities. Beginning in July 1978, an intensive advertising and promotional effort was undertaken to encourage all eligible citizens of Lawrence to register with the program and obtain the identification card that would allow them to receive discount fares. Organizations and agencies with elderly and/or handicapped clients and members were asked to assist in registration, and provisions were made for those who could not register in person. Local media were contacted, and advertisements appeared on the radio and television and in newspapers. Posters were placed in storefronts and brochures were printed in both English and Spanish (see Figure 3-3). A letter campaign was also conducted in which every fifth elderly person listed in the city directory was sent a brochure.

The first day of the demonstration was marked by a grand opening, attended by the mayor, who cut a ceremonial ribbon. The opening coincided with an outdoor performance by the Boston Ballet company, part of festivities promoting the Intown Mall, where the TRANSFARE* office was located. After the first month of project operation, public relations activities continued at a lower level of effort, primarily involving contacts with social service agencies and periodic media announcements.

Overall, despite the high level of promotion and marketing activity, registration for the program was relatively modest. After an initial registration of 1,052 people in the first week, and an additional 1,143 in the following full month, registration declined to a slow but steady rate.

*The name given to the user-side subsidy program in Lawrence.

EL DEPARTAMENTO DESAROLLO COMUNAL DE
LAWRENCE

OFREC

THE COMMUNITY DEVELOPMENT DEPARTMENT OF

LAWRENCE
PRESENTS
TRANSFARE

OFFERING • LIMITED HALF PRICE TAXI RIDES
• UNLIMITED NOMINAL COST BUS RIDES

TO RESIDENTS OF LAWRENCE
REGARDLESS OF INCOME WHO :

- ARE AGE 65 OR OVER
OR
- ARE HANDICAPPED

PURCHASE YOUR REDUCED FARE TICKETS
MONDAY THROUGH FRIDAY
8:30 AM TO 4:30 PM AT

PATROC

TRANSFARE

370 COMMON STREET
(AT THE INTOWN MALL)
LAWRENCE, MA 01840

SPONSORED BY THE U.S. DEPARTMENT OF TRANSPORTATION
AND THE CITY OF LAWRENCE

LAWRENCE P. LEFEBRE - MAYOR

Figure 3-3. TRANSFARE PROMOTIONAL PAMPHLET

3.1.3 Phase III. Ticket Distribution/Redemption System

The user-side subsidy for taxi and bus rides was administered through the sale of tickets that could be used for fare payment on taxi and bus rides to eligible individuals who registered for the program and obtained a project identification card using the procedures described in Phase II (above). Project registrants with proper identification could purchase taxi tickets for half of their face value from the project cashier at the project office. Bus tickets with a value of \$.15 could be purchased for \$.01 each. At the time of purchase, tickets were coded with the user's identification number. When a registrant paid for a taxi or bus trip using the tickets, the identification card had to be shown to prove that the tickets were valid, discouraging unauthorized individuals from trying to take advantage of the subsidy.

Bus tickets were turned in to the project staff regularly and were organized by bus route and by the day they were collected. The project staff counted these tickets and the city treasurer issued payment twice a month to the transit operator, typically on the 12th and the 26th.

When taxi drivers received tickets, they recorded the trip on a log sheet, giving the ID number, origin and destination, fare, and time of day (see Figure 3-4). The log sheets and tickets were turned in periodically (typically at least twice a month) for reimbursement by the city. These tickets were weighed to verify the quantity and then processed by the project staff. Again, payments were typically issued by the city treasurer twice a month.

3.1.4 Phase IV. Lift-Equipped Van Service

The lift-equipped van service was developed after the taxi and bus portions of the subsidy program were in operation, and was designed to fulfill the special travel requirements of the severely handicapped. To be eligible for the service, which was provided by privately owned vans, an individual had to be a resident of Lawrence and be either confined to a wheelchair or walker and unable to use a bus and/or taxi, or require the aid of an escort. Registration again took place at the TRANSFARE program office, though arrangements could be made for the registration interview to be conducted at the client's home. Upon determination that the registrant met the eligibility criteria for the van program (medical verification of

LOG FORMAT TO ACCOMPANY TICKET RETURNS

COMPANY: _____

FRANCHISE OWNER: _____

DATE: _____

	I.D. No.	ORIGIN ADDRESS	DESTINATION ADDRESS	FARE	TIME
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					

Figure 3-4. SAMPLE PROJECT TAXI LOG SHEET

disability could be requested), a regular project photo identification card bearing an ID number unique to the van program was issued.

The fare for a one-way van trip within five miles of the Lawrence Central Business District was set at \$7.50, of which \$5.00 was subsidized, leaving the registrant to pay the \$2.50 difference. An attendant was provided for an additional user charge of \$2.00, or the registrant could provide his own attendant for a charge of \$.50. No restrictions were made on the purpose of trips, but registrants were limited to two round trips or four one-way trips per week, as in the taxi portion of the user-side subsidy program.

The user-side subsidy for the lift-equipped van service was administered through vouchers that could be used for partial payment of fares for van rides made by eligible individuals who registered for the van program and obtained a project identification card using the procedures described above. When a registrant paid for a van trip using a voucher (see Figure 3-5), the identification card had to be shown. This discouraged unauthorized individuals from trying to take advantage of the subsidy. All the data on the voucher were filled in by the driver, including the date, time, origin and destination, user ID number, driver and company code, total fare, and user's share. Waiting time, package charges, and tips were not subsidized, and were the responsibility of the user.

Vouchers were in triplicate, with separate copies given to the user, the service provider, and the TRANSFARE office (for reimbursement). These latter copies were turned in periodically (typically every week) for verification and eventual payment.

For the purposes of the van service, vouchers had significant potential advantages over tickets as a subsidy distribution mechanism. Specifically, vouchers relieve clients of the need to procure and carry an inventory of prepurchased tickets prior to being able to receive service. These are important considerations, given that the van program's clientele of severely handicapped individuals would be particularly inconvenienced by a need to visit the project office to procure tickets, and that the van program's relatively high per-ride user cost would correspond to high carrying costs if tickets were used for van rides.

TRANSFARE

No 519

LIFT EQUIPPED VAN SERVICE

PROVIDER: _____

DRIVER: _____

DATE: _____ TIME: _____

I.D. No. _____

I.D. No. _____

ORIGIN: _____

DESTINATION: _____

TRIP CHARGE:
(one-way) _____ \$7.50

ADDITIONAL CHARGES

ATTENDANT FEE: _____

ADDITIONAL MILEAGE:

_____ miles @ 50 cents ea. _____

GROUP RIDE FEE: _____

Additional handicapped
passengers. _____ @ \$1.00 ea. _____

Additional passenger-
attendant. _____ @ 50 cents ea. _____

TOTAL FARE: _____

SUBSIDY DEDUCTION: _____

CLIENT PAYS: _____

CLIENT'S SIGNATURE: _____

Figure 3-5. LAWRENCE VAN VOUCHER SHEET

An agreement to participate in the van service was negotiated in March 1979 with Town Taxi, which already operated two lift-equipped vans, and service began in April 1979. The project staff promoted the program with pamphlets (see Figure 3-6) and advertised through the local newspapers and radio. In July, project staff members made presentations at local nursing homes to advertise the service and to conduct registration interviews.

In a letter dated November 19, 1979, the operator of Town Taxi informed the project staff that he intended to cease providing service for the TRANSFARE program. The service contract required that 10 days notice be given to the city, and as of November 29, the van service was terminated. The reason given by the operator for withdrawing from the program was that the costs of providing service were too high to make it profitable (though the operator may also have been influenced by the city mayor's support of a competing, nonproject van service). Attempts to negotiate a new contract failed and the van service did not resume under the user-side subsidy demonstration. However, a revised van program was eventually initiated after the project's conversion to local funding (see below).

3.2 ADMINISTRATIVE COSTS

The administrative actions described above that were required to implement and manage the Lawrence user-side subsidy demonstration entailed a considerable effort on the part of the project staff. A number of nonlabor expenses, such as advertising costs and office rental, were also incurred. Project management costs can be divided into those associated with the specific phases of administrative activity described above, those that are essentially overhead, and those that form the subsidy payments themselves, as follows.

3.2.1 Phase I. Preoperational Planning

Preoperational planning activities were carried out almost entirely by the project manager and project planner. Given that project staff members worked for a total of nearly nine months (November 1977 through July 1978) on planning activities, and that some planning effort was undertaken by nonproject personnel (in this case, by the Urban Institute), it

• **VAN SERVICE RULES**

There are no restrictions on the purpose of your trip.

You may use the van service for only two two-way or four one-way trips per week.

• **PARTICIPATING VAN SERVICE**

Town Chair Car 687-7033

NOTE: List of Participating Van Services May Change

TRANSFARE

Page 4

THE COMMUNITY DEVELOPMENT DEPARTMENT OF
LAWRENCE
 PRESENTS
LIFT EQUIPPED
VAN TRANSPORTATION
 AS A COMPONENT OF
TRANSFARE

OFFERING: LIMITED REDUCED FARE VAN TRANSPORTATION
TO RESIDENTS OF LAWRENCE
REGARDLESS OF INCOME WHO:

- ARE CONFINED TO A WHEELCHAIR OR WALKER FOR MORE THAN A SIX MONTH DURATION AND UNABLE TO USE BUS AND/OR TAXI AS A MEANS OF TRANSPORTATION OR
- REQUIRE THE AID OF AN ATTENDANT

REGISTER
 MONDAY THROUGH FRIDAY
 8:30 AM TO 4:30 PM AT
TRANSFARE
 370 COMMON STREET
 (AT THE INTOWN MALL)
 LAWRENCE, MA 01840

OR
 CALL 686-1412 TO ARRANGE FOR A SHORT
 REGISTRATION INTERVIEW AT YOUR HOME

SPONSORED BY THE U.S. DEPARTMENT OF TRANSPORTATION
 AND THE CITY OF LAWRENCE

LAWRENCE P. LEFEBRE — MAYOR

Page 1

TRANSFARE

• **ELIGIBILITY**

You must live in Lawrence and either be confined to a wheelchair or walker, or require the aid of an attendant.

• **REGISTRATION**

If you are unable to register in person at the TRANSFARE office, call 686-1412 to arrange for registration interview at your home. The TRANSFARE office may require medical verification of your disability from a social service agency or licensed physician. Upon registration, you will be given a TRANSFARE identification card.

CARRY THIS CARD WHENEVER you use the van service.
 The van driver will ask to see it.

• **USING YOUR TRANSFARE I.D. CARD**

When you call a participating van service, the driver will ask to see your TRANSFARE I.D. card. At the end of the trip, the driver will fill out a TRANSFARE voucher, you will sign it and the driver will give you a copy.

Page 2

• **COST OF RIDE**

TRIP CHARGE: \$7.50

For a one-way trip within 5 miles of the Lawrence Central Business District. The subsidy will be \$5.00 and you will pay \$2.50. Although most trips will cost you \$2.50, in some cases, you may be required to pay additional fees.

ATTENDANT FEE:

If you need the aid of an attendant, the van service will provide one for a \$2.00 fee or you may provide your own attendant for a 50 cent fee.

ADDITIONAL MILEAGE:

If you travel beyond 5 miles of the Lawrence Central Business District, the cost is 50 cents per mile after the first five miles.

GROUP RIDE CHARGES:

Additional Handicapped Passengers - \$1.00 each.
 Additional Passenger-Attendants - 50 cents each.

SUBSIDY DEDUCTION:

For a single one-way trip by a handicapped passenger, five dollars (\$5.00) will be deducted from the total fare.

CLIENT PAYS:

At the end of the trip, you will pay the driver in cash the difference between the total fare and the subsidy deduction.

Page 3

Figure 3-6. TRANSFARE PROMOTIONAL PAMPHLET FOR LIFT-EQUIPPED VAN SERVICE

is readily apparent that planning activities for this project involved a significant commitment of resources (on the order of \$10,000 or more).

These costs would likely be lower at other sites. This is because 1) Lawrence experienced a variety of costs and delays associated with its position as a demonstration project whose planning and administration was guided and influenced by a number of different organizations; and 2) there were very few models from which to draw experience to simplify preoperational planning activities. However, planning requirements would still be significant, and a number of activities that must be undertaken to implement a user-side subsidy program, such as solicitation of operating funds, were undertaken in Lawrence prior to the preoperational planning phase and are not accounted for here.

3.2.2 Phase II. Administrative Support

Administrative support activities involved virtually all of the project staff and can be divided into costs for user registration and general program support.

1. User registration included the administration of a relatively extensive interview (20-25 minutes to administer and code each interview) for project evaluation purposes (see Appendix A). Registration required an average of 17.2 hours and \$90 (1979 dollars) in direct time and labor cost per month after the project's start-up phase. Under the assumption* that fringe benefits and other nondirect charges add approximately 25 percent to direct labor costs, project registration is estimated to cost \$113 per month. Of course, a considerable portion of this cost may be attributable to evaluation activities, so the total amount should not necessarily be considered an administrative cost of the project itself.
2. General program support included project marketing, promotion and information dissemination, handling of service complaints, maintenance of project records,

*Used by the grantee in supplementary grant application of December 24, 1979.

coordination with other city agencies, and other general project management activities not related specifically to the taxi, bus, or van programs. These activities were carried out primarily by the project manager, planner, and secretary and required an average of 146.2 hours and \$1,247 (1979 dollars) in direct time and labor costs per month after the project's start-up phase. Under the assumption that fringe benefits and other nondirect labor charges add approximately 25 percent to direct labor costs, general program support labor is estimated to cost \$1,559 per month. In addition, direct expenses for advertising, etc. averaged approximately \$63 per month, for an overall average general program support cost of \$1,622 per month. As might be expected, these costs were somewhat higher during the start-up phase of the project, when promotional activities were most intense.

3.2.3 Phase III. Taxi and Bus Ticket Distribution/Redemption System

Taxi and bus ticket distribution/redemption involved the project planner, cashier, and secretary, as well as staff of the city auditor and treasurer. Direct labor costs for ticket distribution/redemption averaged 253.7 hours and \$1,563 per month (in 1979 dollars). Under the assumption that fringe benefits and other nondirect labor charges add approximately 25 percent to direct labor costs, the overall cost of administering the ticket distribution/redemption system is estimated to be \$1,954 per month.

3.2.4 Lift-Equipped Van Service

Direct labor costs for the lift-equipped van service involved primarily voucher processing, and because of the van program's small scale of operation, averaged only 8.6 hours and \$76 per month (in 1979 dollars) after the start-up phase. Under the assumption that fringe benefits and other nondirect labor charges add approximately 25 percent to direct labor costs, the overall cost of administering the lift-equipped van service is estimated to be \$95 per month. Again, these costs were higher during the start-up phase for this service, and user registration costs are not included in this total.

3.2.5 Overhead

Overhead costs include those project costs that are not attributable to any specific aspect of project activity (e.g., rent for office space) and are summarized in Table 3-1.

TABLE 3-1. MONTHLY OVERHEAD EXPENSES

<u>ITEM</u>	<u>COST PER MONTH</u>
Rent	\$242
Heat and electricity	\$150
Telephone	\$ 86
Equipment, materials, supplies, and miscellaneous expenses	<u>\$386</u>
 TOTAL	 \$864

Overall, these costs averaged \$864 per month (1979 dollars). It should be noted that some overhead expense items, such as office equipment, required a substantial initial cash outlay for acquisition, though these items were not "consumed" until later in the project, and are treated here as monthly expenses.

3.2.6 Subsidy

The cost of the subsidy itself was determined by the number (and in the case of taxi, characteristics) of project rides. Subsidy costs averaged approximately \$1.51* per project taxi ride (1979 dollars). For project bus riders, the subsidy was \$.14 per ride, while for project van riders, the subsidy was \$5.00 per ride.

3.3. PROJECT MANAGEMENT COST SUMMARY

The ongoing project management costs (exclusive of start-up costs) described above are summarized in Table 3-2.

*The project subsidy was \$1.41 per project taxi ride prior to the taxi fare increase in July 1979, and \$1.64 per ride after the increase.

TABLE 3-2. ONGOING PROJECT MANAGEMENT COSTS

ACTIVITY	COST (1979 DOLLARS)			
	CONSTANT PER MONTH	ADDITIONAL PER TAXI RIDE	ADDITIONAL PER BUS RIDE	ADDITIONAL PER VAN RIDE
Administra- tive Support	1,735*			
Ticket Distribution/ Redemption	1,954			
Van Service	95			
Overhead	864			
Subsidy		<u>1.51</u>	<u>.14</u>	<u>5.00</u>
TOTAL:	4,648	+ 1.51/ taxi ride	+ .14/ bus ride	+ 5.00/ van ride

*Includes some evaluation activities--may slightly overstate project costs.

Based on this summary, expected administrative costs for similar user-side subsidy projects (in terms of administrative support, fare and subsidy levels, etc.) can be estimated. For example, the annual cost for an operation of this type that averages approximately 10,000 project taxi rides, 21,000 project bus rides, and 40 project van rides per month at equilibrium (i.e., after all start-up activities have been undertaken and the initial wave of project registration has taken place) can be estimated as follows:

$$\begin{aligned}
 \text{Annual cost} &= 12 \times \text{monthly cost} \\
 \text{(1979 dollars)} &= 12 \times (4,648 + (10,000 \times 1.51) \\
 &\quad + (21,000 \times .14) + (5 \times 40)) = \$274,656
 \end{aligned}$$

including the cost of the subsidy itself. This breaks down to \$181,200 for taxi rides (@ \$1.51), \$35,280 for bus rides (@ \$.14) \$2,400 for van rides (@ \$5.00), and \$55,776 in costs that are essentially invariant to ridership (administrative support, overhead, etc.). Allocation of these latter costs to project trips would of course increase the cost-per-ride figures. For example, if all of the administrative support and overhead costs were allocated to the different portions of the program on a per-ride basis, the average project cost per trip

would increase to \$1.66 for project taxi trips, to \$.29 for project bus trips, and to \$5.15 for project van trips. Alternative allocation formulae would of course produce different increases in the average project cost per trip for each project mode.

A summary of actual project revenues from taxi and bus ticket sales and disbursements to taxi and bus service providers is presented in Table 3-3. Total actual project expenditures (in current dollars) were as follows:

1978 (1/31-7/24)	\$ 54,010.23
(7/24-12/31)	\$ 97,259.58
1979	\$275,036.30
1980	\$288,316.80

These figures include evaluation activities conducted by the project staff, and may therefore overstate the costs of the project itself.

3.4 PROJECT FUNDING

In the Lawrence demonstration, the costs described above were covered primarily by the UMTA demonstration grant, which was depleted in September 1980. At that time, financial responsibility for the project was assumed by the Merrimack Valley Regional Transit Authority. Under the MVRTA, the bus portion of the user-side subsidy program was terminated. The MVRTA did not perceive that substantial mobility benefits resulted for elderly and handicapped riders from the reduction in their fares from \$.15 to \$.01 under the subsidy program. Furthermore, as outlined in Chapter 6 (below), the simultaneous provision of user-side and provider-side subsidies when the transit operator is a private operator on a net cost-reimbursement-type contract increases auditing, monitoring, and general administrative requirements. Also, the fact that both the MVRTA jurisdiction and the Trombly bus system extended beyond the geographical boundaries of Lawrence implied that user-side subsidies for Lawrence residents would simply result in a transfer of funds from other communities to Lawrence residents. As a result of these factors, the MVRTA ceased distribution of bus subsidy tickets after September 1980, and would not redeem subsidy tickets for bus rides after December 1980.

TABLE 3-3. TRANSFARE PROJECT REVENUES FROM TAXI AND BUS
TICKET SALES AND DISBURSEMENTS TO SERVICE PROVIDERS

1978	REVENUES FROM TICKET SALES		DISBURSEMENTS TO SERVICE PROVIDERS	
	TAXI*	BUS**	TAXI	BUS
July (24-31)	\$2,530.00	\$327.25	\$ 652.75	\$ 191.55
August	5,435.00	362.00	4,883.50	2,000.70
September	4,710.00	267.75	7,086.00	2,253.90
October	4,870.00	189.25	8,397.25	2,353.95
November	4,970.00	155.00	7,536.75	2,299.50
December	5,145.00	166.50	9,911.25	2,271.75
<u>1979</u>				
January	5,400.00	154.25	9,040.00	1,969.50
February	5,070.00	125.75	10,226.25	1,775.40
March	6,110.00	181.25	11,114.00	2,525.85
April	5,565.00	172.00	10,330.25	2,427.45
May	6,170.00	249.25	10,550.75	2,687.85
June	6,300.00	243.50	11,802.50	2,931.15
July	6,445.00	232.75	12,918.50	2,565.15
August	7,615.00	238.00	12,201.75	3,059.10
September	6,445.00	209.75	13,432.75	2,830.80
October	7,905.00	236.75	15,093.25	3,090.45
November	8,015.00	237.75	14,083.75	3,047.85
December	7,165.00	226.75	16,769.25	3,042.90
<u>1980</u>				
January	8,670.00	225.75	15,130.00	3,024.60
February	7,505.00	217.00	13,682.25	2,861.10
March	7,975.00	230.75	15,194.50	3,105.15
April	7,865.00	217.00	18,074.75	3,240.45
May	8,645.00	259.50	15,229.75	3,484.65
June	7,930.00	235.25	16,202.25	3,262.20
July	8,420.00	227.75	16,229.00	3,060.45
August	9,090.00	376.25	15,045.25	3,045.75
September	9,565.00	466.25	18,148.00	3,354.75
October	9,690.00	***	18,288.75	3,195.60
November	8,155.00	***	18,795.75	2,240.55
December	9,370.00	***	15,534.25	2,142.60

*\$5.00 per book

**\$.25 per book

***Bus ticket sales discontinued in preparation for termination
of bus portion of subsidy program.

SOURCE: Project records.

In March 1981, lift-equipped van service was reinstated by the MVRTA. Fare levels were raised to \$15 per one-way trip, (of which \$2 was paid by the user, with the balance paid using the same type of voucher mechanism as before), which attracted a total of five service providers who were willing to participate (including Town, the service provider for the van program during the demonstration phase). This van program was still operating as of early 1984, and averaging between 350 and 400 subsidized van rides per month.

4. LEVEL-OF-SERVICE CHANGES

The user-side subsidy demonstration in Lawrence had the potential to affect a variety of transportation supply attributes. The direct, primary effects of the demonstration involved fares and level of taxi shared-riding. Secondary effects, such as changes in other level-of-service attributes caused by operator reactions to the project (e.g., if taxi operators perceived that there were differences between the attractiveness of project and nonproject trips, they might act to create corresponding service quality differentials), were much less in evidence. All of these effects are described in detail below.

4.1 PRIMARY EFFECTS

4.1.1 Fare

The most important single change in transportation supply attributes and, indeed, the focus of the entire demonstration, involved the reduction of taxi, bus, and chair-car fares for elderly and handicapped residents of Lawrence. As outlined in Chapter 3, eligible individuals who registered for the TRANSFARE program were able to obtain a 50 percent subsidy for taxi fares through the purchase of discount tickets, and could obtain tickets to ride conventional transit for \$.01 per ride. Chair-car rides with a nominal value of \$7.50 could be purchased for \$2.50 (plus extras) through the use of vouchers. Because of project limitations, the taxi and van discounts were only effective for a maximum of four one-way rides per week, and the taxi subsidy only applied on fares of \$2.75 or less (\$2.50 prior to the July 1979 fare increase). However, given the magnitude of the subsidies, these changes in travel costs as perceived by the user were expected to have significant effects on registrant mobility.

4.1.2 Shared Riding

As outlined earlier, shared riding had previously been allowed in Lawrence only with the consent of the first passenger. When the project started, this restriction was removed, so that rider consent was no longer required.

As a result of this regulatory change, as well as contemporaneous changes in such factors as fuel prices that caused operators to seek out all reasonable opportunities to reduce resource consumption and costs, the level of shared riding increased substantially during the project. Prior to the project, it is estimated* that 24.0 percent of all rides were shared (i.e., 24 percent of all parties receiving taxi service, whether individuals or groups, shared the taxi with at least one previous or subsequent party, with the different parties generally traveling between different origins and destinations). Riders eligible for the project (i.e., elderly and/or handicapped) shared 23.2 percent of their rides, while riders who were not eligible shared 24.2 percent.

During the project, it is estimated** that the level of shared riding increased to approximately 45.5 percent of all rides. Rides by project registrants (52.3 percent) were shared somewhat more often*** than rides by nonregistrants (44.1 percent), with the level of shared riding for both groups substantially higher+ than preproject levels.

4.2 SECONDARY EFFECTS

It is sometimes assumed that the ticket system used for taxi subsidies in Lawrence precluded operator discrimination in the treatment of project and nonproject trips, since an individual did not formally identify him/herself as a project participant until after service had been rendered (i.e., when paying for the ride). However, a large portion of the traffic of each taxi firm in Lawrence involved regular passengers who were recognized by dispatchers and/or drivers. Therefore, it

*Preproject statistics on shared riding are drawn from taxi on-board survey, May 1978.

**Post-implementation statistics on shared riding are drawn from taxi on-board survey, May 1979.

***Difference not statistically significant at the 95 percent level of confidence.

+Statistically significant at the 95 percent level of confidence.

would have been possible in practice for operators to distinguish between likely project and nonproject trips, though this did not lead to extensive service quality differentiation, as shown below.

4.2.1 Wait Time

If taxi operators perceived significant differences between the attractiveness of project and nonproject trips, they might not assign equal importance to providing prompt service to requests from all customers. This attitude could be reflected in a difference in wait times between the trips of project registrants and nonregistrants. For immediate service requests, total wait time consists of the difference between pick-up and service request times. Unfortunately, due to practical limitations on data gathering, it was only possible to measure the difference between the time the dispatcher assigned the ride to a cab, and the time the passenger was picked up. (This excludes the time that elapses between the time the passenger calls for service and the time the dispatcher assigns the ride.) This proxy for total wait time indicated that there were no significant differences between the wait times of project registrants and nonregistrants (means of 5.5(n=10) and 6.0(n=520) minutes, respectively).^{*} Likewise, no difference was evident between registrant and nonregistrant wait times on advanced service requests (i.e., the difference between the actual and scheduled pick-up times). Overall, it appears that taxi service in Lawrence was prompt and punctual for project and nonproject users alike. This reinforces the near-unanimous (over 99 percent) opinion of project registrants that project rides did not entail longer wait times than nonproject rides.^{**}

It is noted, however, that for all (registrant and nonregistrant) immediate service requests during the project, wait times were approximately 1.1 minutes (23 percent) higher than preproject levels. Given that the total number of taxi vehicles in service did not change significantly (see Chapter 6), this suggests the possibility that dispatchers may have delayed slightly the assignments of vehicles to service requests in order to enhance opportunities for shared riding under the revised shared-riding ordinance. Also, increases in

^{*}Taxi on-board survey, May 1979.

^{**}Survey of project registrants, July 1980.

total taxi demand may have occurred during the project that would tend to cause longer wait times with a fixed fleet of vehicles. The extent to which taxi demand increases occurred as a result of the project is examined in detail in Chapter 5.

4.2.2 Ride Time

Given the incentives for taxi operators to provide direct and efficient service once a passenger has been picked up, it is extremely unlikely that operators would deliberately attempt to differentiate the service quality of project registrant and nonregistrant trips in this manner. In fact, ride times of project and nonproject trips did not differ significantly (means of 8.1 (n=129) and 8.2 (n=643) minutes, respectively).* Project registrants were unanimous in their opinion that project rides took no longer than nonproject rides, and over 99 percent of project registrants felt that project ride times were no more variable than nonproject ride times.** Once again, however, it is noted that ride times for all (registrant and nonregistrant) rides during the project were significantly*** higher (by 0.8 minutes) than preproject levels. This change may be attributable to the higher levels of shared riding described above.

4.2.3 Courtesy/Assistance

As shown in Table 4-1, there were differences in the amount of assistance offered by drivers on trips by project registrants and nonregistrants.

*Taxi on-board survey, May 1979.

**Survey of project registrants, July 1980.

***At the 95 percent level of confidence.

Table 4-1. DRIVER ASSISTANCE OFFERED TO PASSENGERS (Percent)

	<u>At Trip Origin</u>		<u>At Trip Destination</u>	
	<u>Physical Assistance</u>	<u>Help With Doors, Packages</u>	<u>Physical Assistance</u>	<u>Help With Doors, Packages</u>
Registrants (n=139)	6.5	8.6	7.6	13.6
Nonregistrants (n=726)	1.4	8.3	1.4	8.6
Eligible (n=65)	0.0	12.3	1.6	12.7
Noneligible (n=661)	1.6	7.9	1.4	8.2

SOURCE: Taxi on-board survey, May 1979.

For example, project registrants received more physical assistance at both trip origins and destinations than nonregistrants.* However, within the category of nonregistrants, individuals who were eligible for the project generally received more assistance than individuals who were not eligible, and in some cases received levels of assistance that were comparable to or higher than those of project registrants. Overall, indications are that the level of assistance offered by drivers depended upon the characteristics and needs of riders, rather than intentional operator efforts to provide service quality differentials. Once again, this was confirmed by the unanimous opinion of project registrants, of whom over 98 percent found no difference in driver courtesy and assistance when comparing project and nonproject trips.**

4.3 SUMMARY

Overall, the most significant supply changes associated with the demonstration project involved the changes in effective taxi, transit, and chair-car fares. The change in taxi regulations at the beginning of the project also contributed to

*Differences are significant at the 95 percent level of confidence.

**Survey of project registrants, July 1980.

a substantial increase in the level of shared riding. Also, taxi operators made no significant effort to differentiate the service they offered to project registrants and nonregistrants. This indicates that taxi operators did not perceive significant differences between the attractiveness of project and nonproject rides. However, wait times did increase slightly during the project, possibly as the result of such factors as dispatcher efforts to facilitate shared riding and project-related volume increases and decreases. Ride times also increased somewhat, possibly as the result of the increase in shared-riding activity.

5. USER IMPACTS AND TRAVEL BEHAVIOR CHANGES

The effect of the taxi, transit, and chair-car fare discount program on the travel behavior of the elderly and handicapped in Lawrence constituted the principal impact of interest in this demonstration. The reductions in travel cost were expected to attract many eligible individuals to register for the program, and to have significant effects on the number and types of trips they made. In this chapter, the characteristics of project registrants and users are described in detail, and the effects of the program on their tripmaking are analyzed.

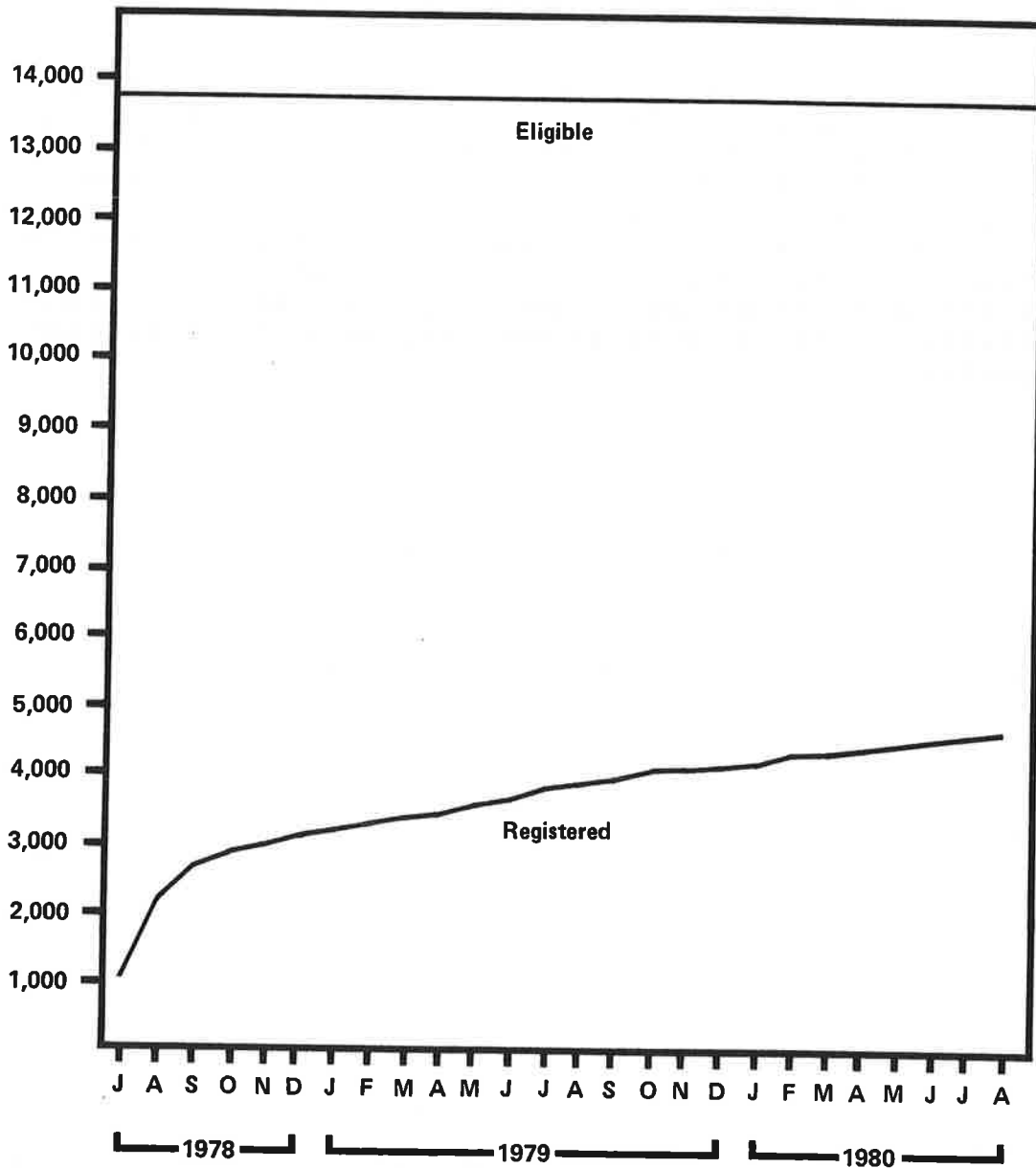
5.1 PROJECT REGISTRATION

As outlined in Chapter 2, it is tentatively estimated that approximately 13,679 elderly and/or handicapped residents of Lawrence were eligible for the TRANSFARE discount program in 1978, and that by 1980 this number had not changed significantly. As of February 1980, a total of 4,170 individuals, representing approximately 30 percent of the estimated eligible population, had registered with the program. Most individuals decided to register after hearing about the program from a friend or relative. Promotional newspaper advertisements were also significant information sources. The cumulative pattern of project registration over time is shown in Figure 5-1.

It is evident from this figure that the proportion of registered individuals in the eligible population was relatively stable for most of the project. However, the inclination of specific individuals to register for the program varied widely and was related to a number of sociodemographic characteristics. A comparison of the characteristics of project registrants and nonregistrants and the penetration achieved by the project in these different market segments are presented in Table 5-1.

Project registrants contain a disproportionately high representation of nonelderly individuals, and overall have slightly more travel handicaps than eligible nonregistrants. The principal exceptions to this are individuals who require a walker or escort to travel, who tend to register for the project less than do other groups. Registrants contain a disproportionately high representation of females, homemakers, and unemployed individuals, and tend to come from smaller

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SOURCE: Eligible population estimated in Chapter 2.

Registration statistics drawn from project records. These statistics may overstate the true number of registrants at any given time, since attrition among registrants has not been accounted for.

Figure 5-1. ELIGIBLE AND REGISTERED INDIVIDUALS

TABLE 5-1. COMPARISON OF PROJECT REGISTRANTS AND NONREGISTRANTS*
(Percent)

	<u>REGISTRANTS</u>	<u>ELIGIBLE NONREGISTRANTS</u>	<u>MARKET PENETRATION**</u>
Age			
5-54	7.5	3.0	.52
55-64	7.6	3.9	.46
65-69	31.5	38.3	.27
70-74	23.0	19.1	.35
75-84	26.3	32.2	.26
85+	4.0	3.5	.33
Sex			
Male	27.7	43.4	.22
Female	72.3	56.6	.36
Race			
White	99.3	98.8	.31
Black	0.5	0.0	***
Other	0.2	1.2	***
Handicap Status			
No handicap	57.5	76.3	.25
Nonambulatory	1.2	2.1	***
Semi-ambulatory	8.0	10.8	.25
Cardiovascular	17.0	7.1	.51
Respiratory	1.7	0.4	***
Nervous system	2.9	0.8	***
Sight	5.4	1.7	***
Hearing	3.2	0.0	***
Mental disorder	3.4	0.8	***
Aids (Multiple Responses)			
Braces	0.5	0.0	***
Artificial limbs	0.3	0.0	***
Crutches	0.9	0.0	***
Wheelchair	1.3	2.1	***
Walker	0.9	3.7	.10
Cane (for walking)	8.2	5.8	.38
Cane (for blind person)	0.6	0.4	***
Escort	1.5	13.3	.05
Other	1.4	0.0	***
Current Driver's License			
Yes	28.5	51.0	.20
No	71.5	49.0	.39
Number of Vehicles in Household			
0	64.0	0.6	***
1	33.1	86.7	.14
2	2.5	11.1	.09
3+	0.4	1.6	***
Household Size			
1	47.4	24.2	.46
2	42.5	61.9	.23
3	6.2	8.2	.25
4+	3.9	5.7	.23
Number in Household 65 Years or Over			
0	13.6	7.0	.46
1	53.2	43.2	.35
2	31.9	48.6	.22
3	1.4	1.2	***

Table continued on following page.

TABLE 5-1. COMPARISON OF PROJECT REGISTRANTS AND NONREGISTRANTS*
(Percent) (CONT.)

	<u>REGISTRANTS</u>	<u>ELIGIBLE NONREGISTRANTS</u>	<u>MARKET PENETRATION**</u>
Number in Household Less than 65 Years and Handicapped			
0	83.3	87.7	.29
1	14.2	11.1	.36
2+	2.5	1.2	***
Employment Status			
Employed full-time	2.2	4.5	.18
Employed part-time	2.5	2.5	***
Unemployed	12.8	0.8	***
Retired	64.2	85.5	.25
Student	0.7	0.4	***
Homemaker	15.2	1.7	***
Other	2.4	4.5	.19
Household Income:			
Less than \$3,000	31.5	2.7	.84
\$ 3,000 to \$4,999	44.9	41.8	.32
\$ 5,000 to \$7,999	17.1	47.3	.14
\$ 8,000 to \$11,999	4.1	8.2	.18
\$12,000 to \$14,999	1.5	0.0	***
\$15,000 to \$20,000	0.7	0.0	***
Over \$20,000	0.2	0.0	***
	(n=4170)	(n=242)	(mean=.30)

*As of February 1980. Total number of registrants = 4,170. Total number of eligible nonregistrants = estimated eligible population (13,679, from Chapter 2) less number of registrants = (13,679 - 4,170) = 9,509. The number of registrants and all related market penetration statistics may be slightly over-estimated, since attrition among registrants has not been accounted for.

**Calculated as (number of registrants in given stratum)/((number of registrants in given stratum) + (percent of eligible nonregistrants in given stratum x number of eligible nonregistrants)).

***Cannot be calculated reliably due to sample-size limitations.

SOURCE: Survey of nonregistrants, June 1980, and registration interviews, July 1978 to February 1980.

households (47 percent live alone) with lower incomes. Of particular relevance to the project, the majority of project registrants do not have a driver's license or an automobile in their household. Conversely, more than half of the nonregistrants do have a license and virtually all of the nonregistrants have at least one automobile in their household.

As a result, registrants and nonregistrants differ significantly in their use of different travel modes. As shown in Table 5-2, over 45 percent of registrants use taxis at least once a week, compared to 0.4 percent of eligible nonregistrants, while 62 percent use buses at least once a week, compared to 2 percent of nonregistrants. Buses and taxis were cited by registrants as their most frequent modes of transportation, while eligible nonregistrants chose the auto driver and auto passenger modes by a wide margin over other alternatives. Indeed, over 80 percent of eligible nonregistrants report that they never use taxis, and 75 percent report that they never use buses.

Reasons cited by nonregistrants for their lack of participation in the program reinforce the importance of auto availability that is evident in the above registrant/nonregistrant comparisons. As shown in Table 5-3, over 70 percent of all nonregistrants indicated that the availability of automobiles to drive or ride in made it unnecessary for them to register for the program. An additional 6 percent indicated they had no need for the program because they walked or did not go out frequently. In contrast, only 27 percent of all nonregistrants had not heard of the program or lacked some information about it, and even these reasons tend to show a lack of need for or interest in the program. It can therefore be concluded that most nonregistrants would be unlikely to join the program under most foreseeable circumstances.

New registrant characteristics changed somewhat over time. Later registrants tended to be made up more of individuals who had just become eligible for the project (i.e., aged 65 to 69), and less of older individuals. Later registrants also consisted to a greater extent of males and handicapped individuals, and had somewhat higher incomes than earlier registrants. Of particular relevance to the project, later registrants had significantly higher access to automobiles through drivers' licenses and/or vehicles owned by the household. This may be attributable to the more widespread proliferation and usage of automobiles among the younger, newly eligible registrants, as well as an increased tendency

TABLE 5-2. TRAVEL CHARACTERISTICS OF PROJECT REGISTRANTS AND NONREGISTRANTS (Percent)

	<u>REGISTRANTS</u>	<u>ELIGIBLE NONREGISTRANTS</u>
Frequency of Taxi Use		
At least once a week	45.2	0.4
At least once a month	15.2	2.9
At least once a year	11.6	10.5
Very infrequently	0.8	4.6
Never	27.2	81.6
Frequency of Bus Use		
At least once a week	62.1	2.0
At least once a month	11.3	8.4
At least once a year	5.2	9.8
Very infrequently	4.0	4.4
Never	17.3	75.4
Most Frequent Mode		
Walk	5.6	4.9
Auto driver	7.3	43.4
Auto passenger	10.5	43.0
Taxi	27.4	4.1
Trombly bus	49.2	3.0
Social service agency	0.0	1.6
Other	0.0	0.0
Second Most Frequent Mode		
Walk	9.7	6.4
Auto driver	5.7	3.0
Auto passenger	19.5	75.2
Taxi	34.1	9.0
Trombly bus	22.8	4.7
Social service agency	0.4	1.7
Other	7.7	0.0
	(n=249)	(n=242)

SOURCE: Survey of project registrants, July 1980, and survey of nonregistrants, June 1980.

TABLE 5-3. REASONS CITED BY NONREGISTRANTS
FOR LACK OF PROGRAM PARTICIPATION

<u>REASON</u>	<u>PERCENT OF ALL NONREGISTRANTS CITING REASON*</u>
Respondent owns car	52.5
Family provides transportation	21.9
Respondent has not heard of TRANSFARE	20.7
Respondent was not aware of eligibility requirements	5.8
Respondent was not aware of TRANSFARE office location	0.4
Respondent lives within walking distance of stores	1.2
Respondent does not go out -- not interested	4.5
	(n=242)

*Does not sum to 100 percent because of multiple responses.

SOURCE: Survey of nonregistrants, June 1980.

for regular auto users to register for the program that may have been caused by problems of gasoline availability and price during 1979.

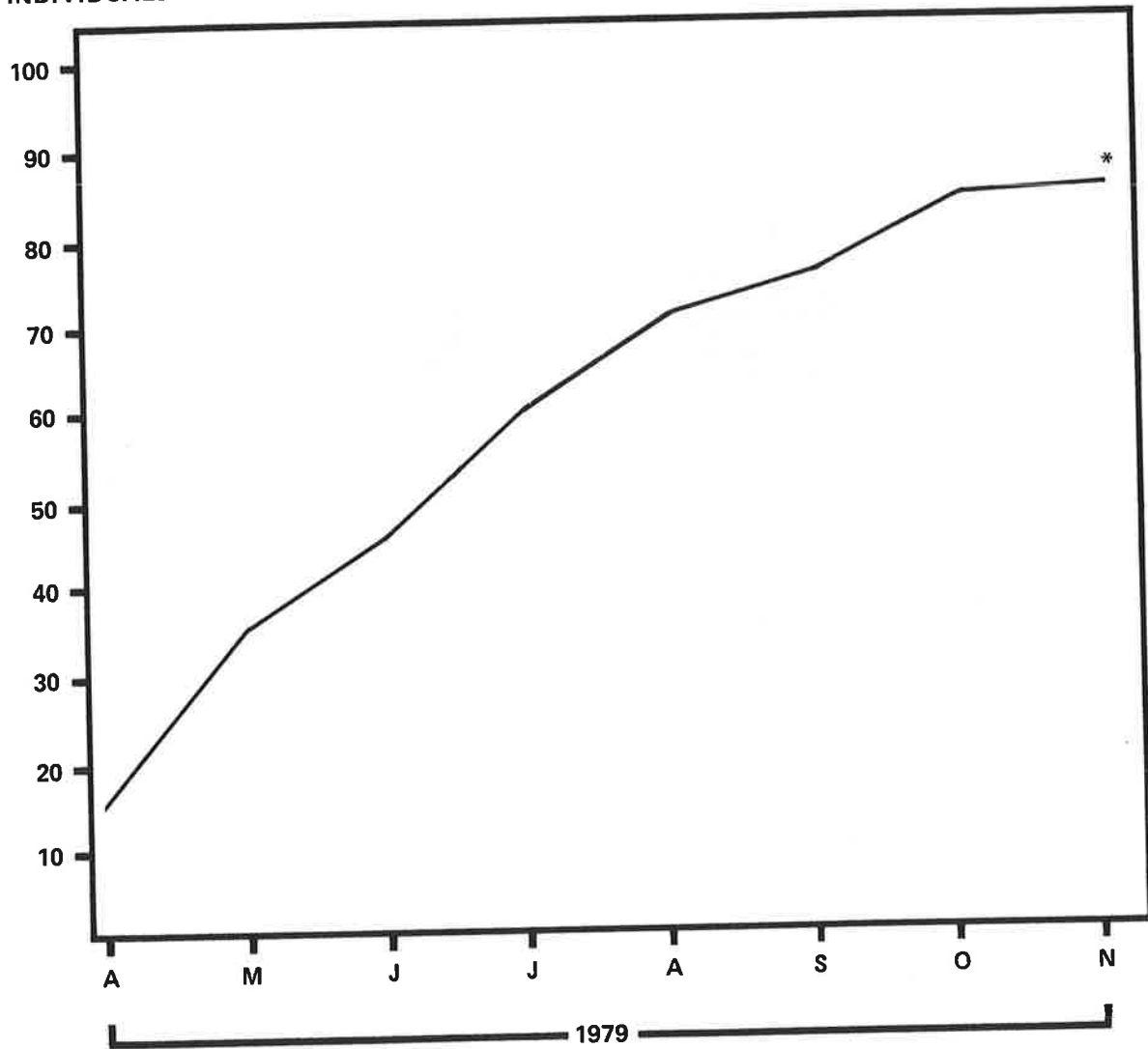
The cumulative pattern of registrations for the lift-equipped van service is shown in Figure 5-2. As might be expected, registrants for the van portion of the subsidy program differed significantly from registrants for the taxi and bus portion. As shown in Table 5-4, van registrants contained a disproportionately high representation of both nonelderly handicapped and extremely elderly (85 years old or older) individuals. All van registrants were handicapped, and nearly 85 percent used wheelchairs, while nearly 60 percent of taxi and bus registrants were not handicapped, and virtually none of those registrants used wheelchairs. Less than 10 percent of van users had a current driver's license (compared to nearly 30 percent of other registrants), though household auto ownership was similar between the two groups.

5.2 PROJECT USE

From the beginning of operations in July 1978, the project experienced a steady growth in taxi ridership to a peak of 10,857 rides per month in April 1980. A summary of the project ridership carried each month by participating taxi firms is presented in Figure 5-3. Project transit ridership also increased steadily to a peak of 23,231 rides per month in May 1980, as shown in Figure 5-4. Project van ridership reached its peak of 82 rides per month in July 1979, three months after the beginning of service. However, by October 1979, ridership was down to 30 trips per month, and as described in Chapter 3, service was terminated by the service provider during the following month. Under these circumstances, it is not possible to draw reliable inferences concerning the impact of a stable van program on registrant mobility. Therefore, the remainder of the analyses in this chapter will focus on the utilization and mobility impacts of the taxi and bus subsidies.

Among registrants, there was wide variation in the extent to which project discounts were utilized for taxi and bus service. As shown in Figure 5-5, 23.5 percent of all registrants utilized the taxi portion of the subsidy program but not the bus portion, 23.5 percent used bus but not taxi, 36.1 percent used both, and 16.9 percent used neither. Differences in modal utilization appear to be related to a number of registrant characteristics. As shown in Appendix D (Table D-1), the group of taxi (only) users tended to be the

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*Service provider withdrew from program.

Figure 5-2. REGISTRATION FOR LIFT-EQUIPPED VAN SERVICE

TABLE 5-4. COMPARISON OF VAN REGISTRANTS WITH OTHER REGISTRANTS
(Percent)

	<u>VAN</u>	<u>TAXI/BUS</u>
Age		
5-54	15.1	7.4
55-64	15.1	7.5
65-69	7.6	31.8
70-74	13.2	23.1
75-84	18.9	26.4
85+	30.2	3.7
Sex		
Male	44.2	27.5
Female	55.8	72.5
Handicap Status		
No handicap	0.0	58.2
Nonambulatory	78.7	0.2
Semi-ambulatory	4.3	8.0
Cardiovascular	2.1	17.2
Respiratory	0.0	1.7
Nervous system	10.6	2.8
Sight	2.1	5.4
Hearing	2.1	3.2
Mental disorder	0.0	3.4
Aids (Multiple Responses)		
Braces	4.4	0.4
Artificial limbs	4.4	0.3
Crutches	8.7	0.8
Wheelchair	84.8	0.3
Walker	19.6	0.7
Cane (for walking)	10.9	8.2
Cane (for blind person)	2.2	0.5
Escort	6.5	1.4
Other	2.2	1.4
Current Driver's License		
Yes	8.5	28.7
No	91.5	71.3
Number of Vehicles in Household		
0	60.9	64.0
1	30.4	33.1
2	8.7	2.5
3+	0.0	0.4
Household Size		
1	21.7	47.6
2	52.2	42.4
3	8.7	6.2
4+	17.4	3.8
Number in Household 65 Years or Over		
0	39.1	13.4
1	26.1	53.3
2	34.8	31.8
3	0.0	1.4
Number in Household Less than 65 Years and Handicapped		
0	56.5	83.5
1	39.1	14.0
2+	4.4	2.5
Household Income:		
Less than \$3,000	28.1	31.5
\$ 3,000 to \$4,999	43.8	44.9
\$ 5,000 to \$7,999	18.8	17.1
\$ 8,000 to \$11,999	3.1	4.1
\$12,000 to \$14,999	0.0	1.5
\$15,000 to \$20,000	3.1	0.7
Over \$20,000	3.1	0.2
	(n=53)	(n=4117)

SOURCE: Registration interviews, July 1978 to February 1980.

PROJECT RIDES

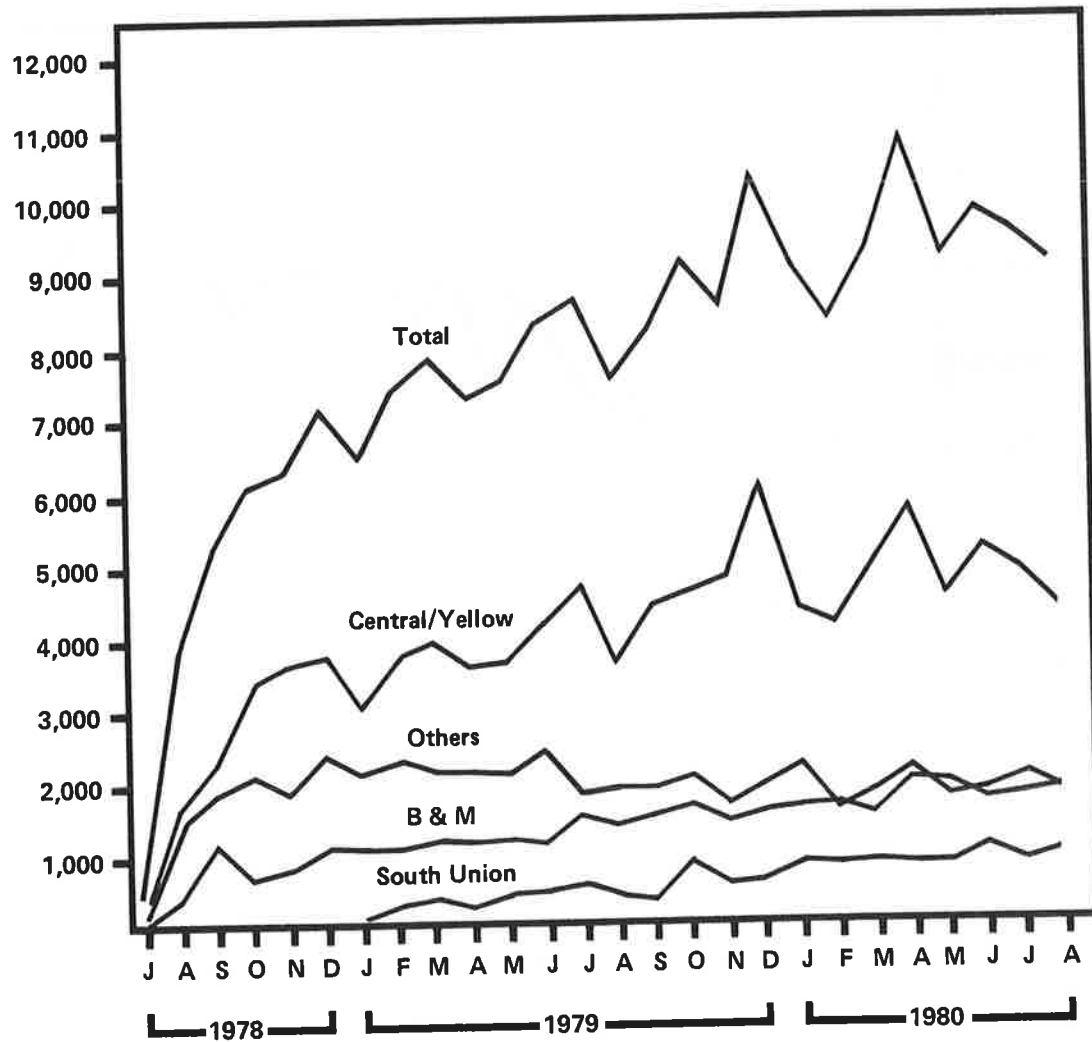


Figure 5-3. SUMMARY OF PROJECT TAXI RIDERSHIP

PROJECT RIDES

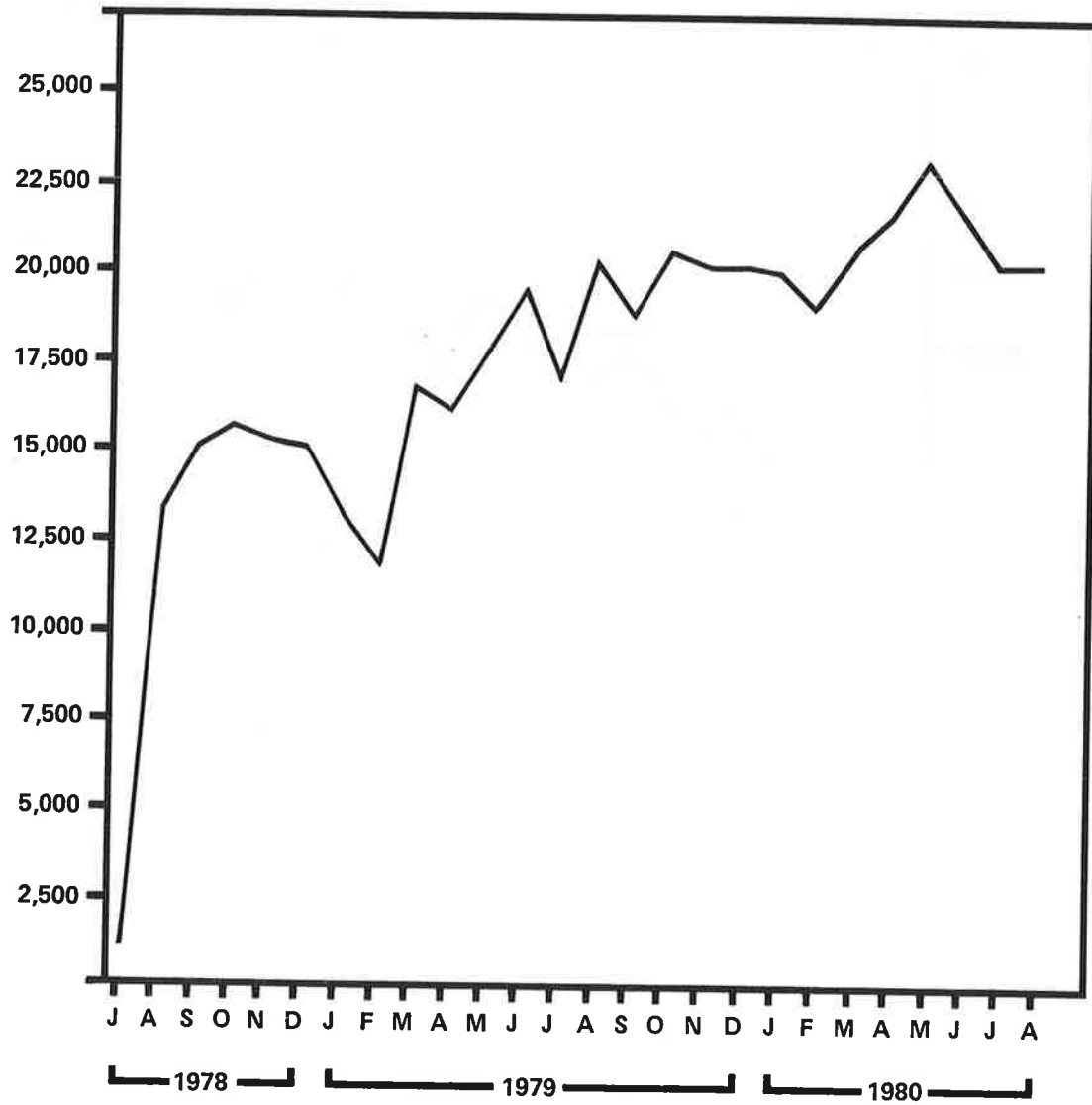
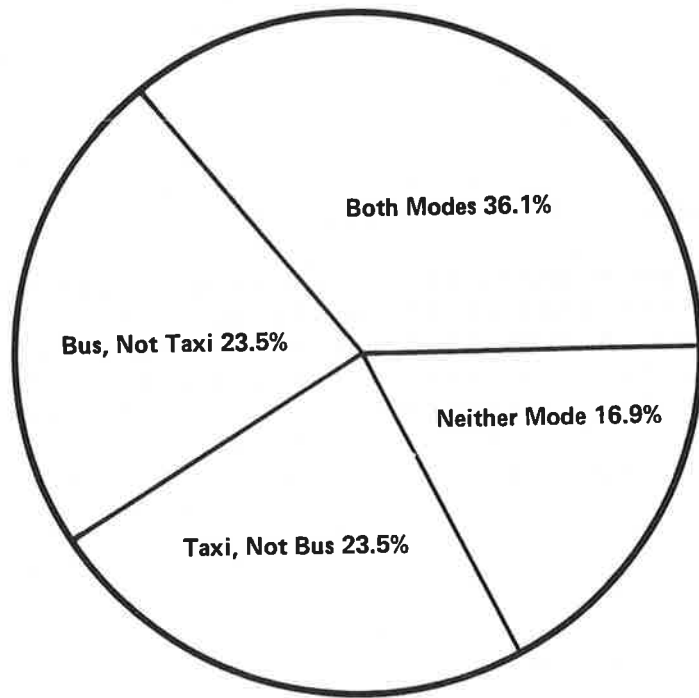


Figure 5-4. SUMMARY OF PROJECT TRANSIT RIDERSHIP



(n = 3410)

SOURCE: Taxi and bus ticket use records.

Figure 5-5. REGISTRANT UTILIZATION OF PROJECT TAXI AND BUS SERVICES

oldest. The group of taxi (only) and taxi and bus users generally had the highest incidence of handicaps (including nonelderly handicapped) and females, and had the lowest incomes and fewest ride sources (driver's licenses, vehicles in household). On the other hand, the group of bus (only) users had a higher representation of males, slightly higher incomes, lower handicap levels, and somewhat more ride sources. As might be expected, registrants who did not utilize project discounts at all had the fewest handicaps, highest incomes, and most ride sources of all registrants.

Within each mode, there was also a wide variation in the extent to which project discounts were utilized, and this also appears to be related to a number of registrant characteristics. As shown in Appendix D (Table D-2), the group of intensive taxi users contained a disproportionately high representation of handicapped individuals (including the nonelderly handicapped). The individuals tended to be workers, though they had the fewest ride sources of any group and resided in the smallest households (nearly 60 percent lived alone).^{*} Overall, nearly 42 percent of all project registrants averaged at least one project taxi trip per month, while nearly 10 percent of all registrants averaged seven or more project taxi trips per month. Among registrants who chose to utilize the taxi portion of the project to at least some extent, the average trip rate was approximately 3.7 project taxi trips per month.

The bus portion of the project was also intensively utilized, with nearly 26 percent of all project registrants making project bus trips at least five times per month. As shown in Appendix D (Table D-3), intensive bus users contained a disproportionately high representation of males, and tended to be somewhat younger than other registrant groups. As was the case with taxi, the most intensive bus users tended to be workers who resided in the smallest households and had the fewest available ride sources. Overall, among registrants who chose to utilize the bus portion of the project to at least

^{*}It is noted here that approximately 1.5 percent of all registrants exceeded the project's nominal taxi usage rate limit of four subsidized trips per week on a consistent basis. These individuals had characteristics similar to those of the group of intensive taxi users (seven or more trips per month) described above, in that they contained a disproportionately high representation of handicapped individuals (particularly nonelderly handicapped) and workers, and had few ride sources (11.8 percent had driver's licenses, 7.8 percent had a vehicle in their household).

some extent, the average trip rate was approximately 7.8 project bus trips per month.

Project utilization was also related to the time of registration by the users. As shown in Table 5-5, early registrants generally tended to make greater use of project discounts. This reflects the fact that the neediest individuals are likely to have registered for the program immediately, while those whose needs were less pronounced may have delayed their registration until their circumstances more clearly demonstrated the utility of the discount program. Given that later registrants may have consisted to some degree of auto users who registered for the program due to gasoline availability and price problems in 1979, the observation that earlier registrants made greater use of the project is consistent with the role of auto travel alternatives in the determination of project-use frequency described above. This is also consistent with the hypothesis that at least some later registrants used the program as "insurance" against the possibility of a major gasoline shortfall rather than as a day-to-day method of financing travel.

Changes in user characteristics after registration may also have had a significant or even overriding effect on a user's attitude toward and need for the project. Some registrants may have died or moved away from Lawrence, precluding their active participation in the program. The extent of this sort of attrition is difficult to document, since individuals who chose not to use the program cannot be distinguished from those who were not able to. However, the exit of registrants from the program over time is likely to be a nontrivial phenomenon that must be considered, at least implicitly, when nominal registration totals or aggregate use rates are being analyzed.

Changes that did not involve the permanent departure of registrants from the program also affected project usage. At a minimum, registrants grew older over time and experienced corresponding changes in their travel behavior. Other specific changes experienced by TRANSFARE project registrants during the course of the demonstration that are relevant to project use included changes in household size, residence location within Lawrence, employment status, handicap status, vehicle ownership, and income. While these changes may not have been large on a net basis, and accrued to relatively few registrants (15 percent or less)*, they are likely to have had significant effects on the use rates of at least some project participants.

*Survey of project registrants, July 1980.

TABLE 5-5. PROJECT USE BY DATE OF REGISTRATION
(Percent)

AVERAGE NUMBER OF PROJECT TAXI TRIPS PER MONTH	TAXI	
	REGISTRATION DATE	
	<u>7/78 TO 12/78</u>	<u>1/79 TO 2/80</u>
0	38.2	55.2
0-0.9	19.4	6.1
1.0-6.9	33.1	27.3
7.0+	9.3	11.4
	(n = 2,986)	(n = 429)

AVERAGE NUMBER OF PROJECT BUS TRIPS PER MONTH	BUS	
	REGISTRATION DATE	
	<u>7/78 to 12/78</u>	<u>1/79 to 2/80</u>
0	38.8	51.6
0-4.9	33.9	32.6
5-15.9	18.2	12.7
16.0+	9.2	3.0
	(n = 2,986)	(n = 432)

SOURCE: Registration interviews, July 1978 to February 1980, and taxi and bus ticket use records.

Project registrants expressed a number of specific reasons for not making greater use of the subsidy program (see Tables 5-6 and 5-7). With regard to the taxi subsidy, the majority of reasons relate to a lack of need for increased taxi travel rather than difficulties experienced in utilizing program taxi discounts. However, almost 20 percent indicated that the discount ticket use limit of four trips per week acted as a constraint on their project tripmaking. Conversely, no registrant reported any difficulty in getting information on the taxi portion of the subsidy program or in learning how to use it. Overall, therefore, it appears that the project use limitation may have been the only policy-sensitive variable that had a significant effect on project use aside from the level of the subsidy itself. This idea is supported by the responses of registrants to questions concerning project tickets. Nearly all project registrants (91.3 percent) said they never took taxi trips without using project tickets and more than 66 percent, when asked directly, responded that they would buy more project tickets if it were permitted.

The reasons cited by registrants for not using the bus subsidy tend more to indicate that conventional fixed route bus service did not meet many of their travel needs. Nearly 28 percent reported that they had difficulty using buses because of health problems, or that the bus routes did not come close enough to their trip origins or destinations. No registrants reported any difficulty in obtaining information about the bus subsidy, and only 1.6 percent indicated that they had had any difficulty in acquiring bus tickets.

5.3 TRAVEL BEHAVIOR CHANGES

The information presented above provides detailed perspectives on the types of individuals who registered for the project and the extent to which they made use of project subsidies. However, this, in and of itself, does not represent a change in travel behavior that is attributable to the program, since it has not been established that the same individuals would not have made the same trips if the program had never been implemented.* Such changes in travel behavior that reflect changes in registrant mobility caused by the subsidy program are of particular interest in this demonstration.

*See, for example, Charles River Associates, Measurements of the Effects of Transportation Changes, prepared for U.S. Department of Transportation, July 1972.

TABLE 5-6. REGISTRANT RESPONSES TO QUESTION:
 "WHY HAVEN'T YOU USED TRANSFARE MORE TO RIDE TAXIS?"

REASON	PERCENT OF REGISTRANTS CITING REASON*
Expense	24.7
Don't want to run out of tickets	17.0
Bus route close by (cheaper than taxi)	14.5
Own car -- tickets for emergency	11.5
Don't want to abuse program	2.6
Only use taxi when traveling with wife	0.8
Dislike taxi drivers	0.4
Registered but did not purchase tickets	0.4
Health problems	0.4
No reason	35.7
	(n=235)

TABLE 5-7. REGISTRANT RESPONSES TO QUESTION:
 "WHY HAVEN'T YOU USED TRANSFARE MORE TO RIDE BUSES?"

Health problems (difficulty walking, bus step too high)	17.2
Owns car -- tickets purchased for emergency	9.2
Bus route not convenient to home	9.6
Family provides transportation	4.2
Bus route not convenient to some destinations	0.8
No reason	59.8
	(n=239)

*Does not sum to 100 percent because of multiple responses.

SOURCE: Survey of project registrants, July 1980.

For the purposes of this analysis, changes in travel behavior can usefully be categorized into effects on overall travel frequency, trip purpose, mode, destination, and timing. Changes of each of these types that are attributable to the subsidy project are described below.

5.3.1 Travel Frequency

Changes in overall travel frequency that occurred because of the program are extremely significant because they represent both the primary measure of changes in registrant mobility and a principal cause of changes in the total volume of travel handled by service providers. At an aggregate level, it is evident that the taxi portion of the program increased taxi usage by the elderly and handicapped. For example, the percentage that elderly and handicapped riders formed of total taxi ridership increased from 17.5 to 23.8 after the beginning of the demonstration, with 67.2 percent of the latter figure composed of project registrants.* Also, over 40 percent of all registrants indicated** that they had increased their frequency of taxi use since the project began.

In the taxi portion of the program, it is estimated*** that 24.8 percent of all trips made by project registrants would not have been made in the absence of the subsidy program. Since project trips accounted for approximately 97.1 percent of all registrant taxi trips,+ project-induced trips are estimated to account for 25.5 percent ($.248/.971$) of all project trips. Based on the approximate project utilization rate of 3.7 taxi rides per month for project registrants who used the taxi portion of the program (see above), this is the equivalent of .94 ($=.255 \times 3.7$) project-induced taxi trips per taxi-using registrant per month. While these figures must all be viewed somewhat tentatively due to their reliance on registrant recall, they tend to suggest that the effect on overall tripmaking attributable to the taxi portion of the program was positive but modest.

*Taxi on-board surveys.

**Survey of project registrants, July 1980.

***Based on analyses of registrant-reported mobility data from taxi on-board surveys.

+Survey of project registrants, July 1980.

This finding is corroborated by the results of analyses of the Lawrence travel diary surveys* conducted at the Transportation Systems Center**. For example, as shown in Table 5-8, able-bodied elderly*** nonusers of project subsidies experienced a net decrease in their tripmaking of approximately 3.5 trips per month, presumably due to factors external to the project (e.g., aging). By comparison, project taxi users+ also experienced a decrease in total tripmaking but of a smaller magnitude (1.3 trips per month). This is consistent with the small but positive impact of the taxi portion of the project on registrant mobility identified previously, and is also consistent with more detailed statistical analyses conducted by TSC.

Relative to the taxi portion of the subsidy program, the bus portion appears to have had a slightly larger impact on tripmaking. As shown in Table 5-8, project bus users represent

*As described in Appendix A, travel diary surveys, which involved respondent-maintained tabulation and description of each trip taken during a four-week period, were administered in May 1978 (prior to the project) to 285 project-eligible individuals in Lawrence. This survey was repeated in May 1979 (10 months after project start-up) with 251 respondents, most of whom also participated in the first round.

**Published results from the diary survey analyses are presented in Jesse Jacobson, Selectivity Bias in the Response to a Transportation Assistance Project, TSC, January 1983; Jesse Jacobson, Bus, Taxi and Walk Frequency Models Which Account for Sample Selectivity and the Simultaneous Equation Bias, 1982; and Howard Slavin and Jesse Jacobson, A Travel Diary Analysis of the Mobility of the Elderly and the Transportation Handicapped, TSC, July 1981.

***The group of able-bodied elderly diary participants was examined in the greatest detail during the TSC analyses.

+It is important to note that all of the statistics for "taxi users" reported from the TSC diary analyses include taxi users who also used the bus portion of the program. Likewise, results reported for "bus users" include individuals who also used the taxi portion of the program. Comparisons made using these statistics must therefore be treated as approximate and illustrative in nature, since the separate impacts of the taxi and bus portions of the subsidy program have not been identified precisely.

TABLE 5-8. TRIP RATES BY MODE AND PROJECT PARTICIPATION STATUS -- ABLE-BODIED ELDERLY (Trips per month)

Mode	Month and Year	All Sample	Project Users (Taxi and/or Bus)	Project Bus Users**	Project Taxi Users**	Nonusers*
Bus	May 1978	3.52	7.18	9.97	8.27	1.31
	May 1979	6.22	12.82	16.51	11.77	2.23
Taxi	May 1978	2.43	3.69	3.83	5.33	1.67
	May 1979	3.22	5.57	4.37	8.6	1.80
Walk	May 1978	40.27	49.27	54.54	42.9	34.83
	May 1979	37.12	44.98	49.69	39.93	32.37
Other*	May 1978	62.83	39.86	35.29	44.17	76.73
	May 1979	60.13	36.24	33.57	39.07	74.58
TOTAL	May 1978	109.05	100.00	103.63	100.67	114.52
	May 1979	106.69	99.61	104.14	99.37	110.97
		(n=130)	(n=49)	(n=35)	(n=30)	(n=81)

*Estimated by Charles River Associates.

**Does not exclude users of both project bus and project taxi subsidies.

SOURCE: Jacobson, Jesse, Bus, Taxi and Walk Frequency Models Which Account for Sample Selectionivity and the Simultaneous Equation Bias, U.S. Department of Transportation, Transportation Systems Center, November 1982.

the only group among the able-bodied elderly to have experienced an increase in total tripmaking (approximately 0.5 trips per month) during the diary survey interval, compared to the decrease of 3.5 trips per month experienced by nonusers. This is consistent with the results of more detailed statistical analyses conducted by TSC, and with the fact that over 47 percent of all registrants reported that they increased their frequency of bus use after the project began.* However, even the observed difference of 4 trips per month between (able-bodied elderly) project bus users and project nonusers described above represents a relatively small fraction of total tripmaking.

5.3.2 Trip Purpose

As shown in Table 5-9, project registrant taxi rides tended to be for shopping/personal business, visiting friends/relatives, entertainment/recreation, and medical trips. This confirms the opinions of project registrants, who indicated that these were the principal types of trips they made more of because of the TRANSFARE program (see Table 5-10). These results are similar to those found in the bus portion of the program, where project registrants indicated that shopping, entertainment/recreation, visiting friends/relatives, and personal business were the principal types of bus trips they made more of because of the TRANSFARE program (see Table 5-11).

5.3.3 Mode

Increases in total taxi and transit usage resulting from the subsidy program include trips that were diverted to the project modes from other methods of travel. Such trips do not represent an increase in total tripmaking by project registrants, but would tend to indicate that the project subsidies have enabled at least some registrants to substitute more preferred modes for less convenient methods of travel. While project registrants tend to be individuals who do not own or drive automobiles, and would rely heavily on at least conventional buses even in the absence of the program (see, for

*Survey of project registrants, July 1980.

TABLE 5-9. TAXI TRIP PURPOSES
(Percent)

<u>PURPOSE</u>	<u>PROJECT REGISTRANTS</u>	<u>ALL RIDERS</u>
Work/School	4.3	21.5
Shopping/Personal Business	42.9	31.2
Medical	9.3	8.1
Visit Friends, Relatives	17.1	18.1
Entertainment/Recreation	14.3	12.8
Social Service Agency	2.9	3.0
Religious	6.4	3.2
Other	2.9	2.1
	(n=140)	(n=903)

SOURCE: Taxi on-board survey, May 1979.

TABLE 5-10. REGISTRANT RESPONSES TO QUESTION:
 "WHAT KINDS OF TAXI TRIPS DO YOU TAKE
 MORE BECAUSE OF TRANSFARE?"*

<u>PURPOSE</u>	<u>PERCENT**</u>
Work/School	4.9
Visit Friends, Relatives	33.0
Shopping	77.7
Religious	1.9
Medical	53.4
Personal Business	18.4
Entertainment/Recreation	28.2
Other	6.8

^aAsked only of registrants who indicated taxi use frequency increases (n=103).

^bDoes not sum to 100 percent because of multiple responses.

SOURCE: Survey of project registrants, July 1980.

TABLE 5-11. REGISTRANT RESPONSES TO QUESTION:
 "WHAT KINDS OF BUS TRIPS DO YOU TAKE
 MORE BECAUSE OF TRANSFARE?"*

<u>PURPOSE</u>	<u>PERCENT**</u>
Work/School	0.8
Visit Friends, Relatives	83.1
Shopping	93.2
Religious	0.8
Medical	8.5
Personal Business	19.5
Entertainment/Recreation	89.8
Other	2.5

*Asked only of registrants who indicated bus use frequency increases (n=118).

**Does not sum to 100 percent because of multiple responses.

SOURCE: Survey of project registrants, July 1980.

example, Table 5-2), it is estimated* that approximately 23.0 percent of project registrant taxi trips would have been made before the program using some other means. An alternative estimation approach based on the changes in primary travel modes (presented in Table 5-12) indicates that some 31.1 percent (= 85.7 - 54.6) of project registrant taxi trips would have been made before the program by bus, driving or riding as a passenger in an automobile, walking, or other means. This is again consistent with the results of the travel diary survey analyses conducted at the Transportation Systems Center. As shown in Table 5-8, able-bodied elderly project taxi users experienced decreases in their utilization of walk and other** travel modes that exceeded the corresponding decreases experienced by nonusers by approximately 0.5 and 2.9 trips per month, respectively. Cumulatively, this represents nearly 40 percent of the reported taxi trip rate of project taxi users.

Given the earlier finding that new, project-induced trips accounted for 25.5 percent of all project trips, it can be seen that the conservative estimate of an additional 23.7 percent (.230/.971***) of project trips that resulted from modal diversion yields a total increase in taxi usage that is attributable to the project of 49.2 percent of all project trips. This is consistent with the extremely supportive attitudes expressed toward the project by the participating taxi operators.+

Relative to the taxi portion of the subsidy program, the bus portion appears to have diverted more walk trips and fewer trips from other modes. As shown in Table 5-8, able-bodied elderly project bus users experienced a decrease in their utilization of the walk mode that exceeded the corresponding decrease experienced by nonusers by approximately 2.4 trips per month. This represents nearly 15 percent of the reported bus trip rate of project bus users.

*Based on analyses of registrant-reported mobility data from taxi on-board surveys.

**Includes drive alone and auto passenger.

***The fraction that project trips formed of total registrant taxi trips.

+Taxi operator interviews, July 1979.

TABLE 5-12. PRIMARY MODE FOR TRAVEL TO DESTINATIONS
OF PROJECT REGISTRANT TAXI TRIPS

<u>MODE</u>	<u>BEFORE TRANSFARE PROGRAM*</u>	<u>DURING TRANSFARE PROGRAM**</u>
Auto Driver	2.5	0.0
Auto Passenger	10.1	3.4
Bus	9.2	5.9
Taxi	54.6	85.7
Walk	5.9	3.4
Social Service Agency	0.0	0.0
Other	17.7	1.7
	(n=119)	(n=119)

*Response to question: "By what means do you usually travel to this place now?"

**Response to question: "By what means did you usually travel there before (the TRANSFARE program)?"

SOURCE: Taxi on-board survey, May 1979.

It is interesting to note that project bus users experienced increases in their usage rate of taxis, and vice versa. This is again indicative of the fact that the reported results for each type of user in fact include individuals who used both the taxi and bus portions of the subsidy program. Again, comparisons made using these statistics must be treated as approximate and illustrative in nature, since the separate impacts of the taxi and bus portions of the subsidy program have not been identified precisely.

5.3.4 Destination

Changes in trip destinations are potentially important impacts of a subsidy program of this type, since they could affect the characteristics of the demand encountered by operators and the activity levels of different establishments, as well as indicate a quantum improvement in the mobility of project riders. In the taxi portion of the program, registrants indicated* that approximately 82 percent of their trips involved the same destinations as they did prior to the program. Also, it must be noted that changes in destination that did occur may have been related to changes in the level of registrant need for the services available at different destinations, or the closing of previous destinations, rather than an enhancement of registrant mobility attributable to the project. However, it can be inferred from the data presented in Chapter 3 concerning average fare (and subsidy) levels that project registrant destination choice in general was at least somewhat sensitive to fare-level changes (i.e., because the average fare did not increase by the full amount of the zonal fare increase). It is therefore concluded that a small number of project-related taxi trips may have involved destinations that were not previously visited for a given trip purpose. This is consistent with the fact that small percentages (approximately 3 percent) of project registrant taxi rides involved destinations that were "better" and/or farther away than preproject destinations for the same types of trips.*

Similarly, it is unlikely that the bus portion of the subsidy program induced large amounts of travel by registrants to any destinations that would not previously have been visited

*Taxi on-board survey, May 1979.

for a given trip purpose. This is because the bus fare was essentially invariant to distance, or "flat," so that changes in absolute fare levels associated with the project could not affect the relative attractiveness of different destinations, at least for trips that would not have been made previously, or trips that would have been made previously using transit. It is noted that for trips that would have been made previously using a mode other than transit, some changes in destination choice could take place. Overall, however, it is concluded that the transit portion of the program did not affect destination choice to a significant degree.

5.3.5 Trip Timing

Effects of the project on trip timing may serve to indicate significant mobility changes, as the higher volume of travel produced by the project could provide registrants with a greater amount of temporal "coverage" and flexibility for trip purposes of all types. This may be particularly true for the taxi portion of the program, given the relatively small number of taxi trips taken by registrants during any given week or even month. In light of the travel frequency increases attributable to the project that were described above, it can be presumed that temporal "coverage" and flexibility did in fact improve as a result of the project. This is supported by the opinions of project registrants, who indicated* that the timing of approximately 7 percent of their taxi trips changed after the project began. Unfortunately, because of data limitations and the fact that changes in timing that did occur may have been related to changes in registrant need and time availability (e.g., employment status) and not changes in registrant mobility per se, further quantification of this effect is not possible at this time.

*Taxi on-board survey, May 1979.

5.4 SUMMARY

Overall, approximately 30 percent of the estimated eligible market registered for the subsidy project. These individuals tended to come from the most mobility-disadvantaged segments of the eligible population. Registrants made use of the taxi and bus subsidies in different combinations and to widely varying degrees, with an average usage rate among taxi users of approximately 3.7 project taxi trips per month, and a usage rate among bus users of 7.8 project bus trips per month. However, despite the limitations (described previously) on the ability of the project staff to monitor closely every registrant's project usage rate, consistent overuse of the project's taxi subsidies was confined to a very small proportion (1.5 percent) of registrants.

Slightly over 25 percent of all project taxi trips would not have been made in the absence of the subsidy program, the equivalent of nearly one project-induced taxi trip per taxi-using registrant per month. In addition, nearly 24 percent of project taxi trips resulted from modal diversion, yielding a total increase in taxi usage that is attributable to the project of approximately 49 percent of all project taxi trips. For bus, it is tentatively estimated that on the order of 25 percent of project bus trips would not have been made in the absence of the subsidy program, with an additional 15 percent of project bus trips attributable to modal diversion. All of these changes represent relatively small percentage changes in total registrant tripmaking. Changes in trip destination and timing due to either portion of the subsidy program were minor or nonexistent.

6. OPERATOR IMPACTS AND PRODUCTIVITY CHANGES

The user-side subsidy program had the potential to affect substantially transportation service providers in Lawrence in a number of ways. For example, operator costs could be increased by program administrative requirements. Conversely, vehicle productivity and profitability could change with changes in registrant travel behavior. Effects of all of these types on the taxi and transit operators in Lawrence are described below.

6.1 TAXI

At an aggregate level, it is quite evident that the user-side subsidy program in Lawrence was generally well received by taxi operators. Soon after the beginning of the project, all taxi operators in Lawrence were participating in the program. Furthermore, the program was able to maintain this participation rate for its duration. The ability of the project to attract and maintain the cooperation of taxi operators in this manner is a strong indicator of the basic feasibility of the user-side subsidy concept.

In light of the impacts of the project on registrant mobility (described in Chapter 5), it is not surprising that operators were generally receptive to the project. Between travel frequency increases (24.8 percent of project registrant taxi trips) and mode changes to taxi (23.0 percent of project registrant taxi trips), new taxi trips amounted to on the order of 47.8 percent of all project registrant taxi trips, or approximately 7.6 percent of all taxi traffic in Lawrence.

As shown in Table 6-1, taxi trips by project registrants were comparable to nonregistrant trips in terms of the revenues generated and resources consumed. Registrant rides involved somewhat higher levels of driver assistance at trip origins and destinations, but this did not result in a significant difference in total dwell times. Furthermore, as described in Chapter 4, there was a general increase in the level of shared riding associated with the change in the ordinance governing shared-ride practices and contemporaneous changes in such factors as fuel prices. The level of shared riding increased from approximately 24.0 percent of all rides prior to the project to approximately 45.5 percent during the project, with rides by project registrants (52.3 percent) shared

TABLE 6-1. CHARACTERISTICS OF PROJECT REGISTRANT
AND NONREGISTRANT TRIPS

	<u>REGISTRANT</u>	<u>NONREGISTRANT</u>
Driver Assistance at Origin (Percent of Rides)		2.5
To find rider	2.3	1.4
To physically help rider	7.0	7.9
To help with bags or open door only	7.8	
Total	17.1	11.8
Empty Mileage Prior to Pick-up (Mean)	1.3 miles	1.4 miles
Number of Riders Per Trip (Mean)	1.21	1.32
Shared Rides (Percent)	52.3	44.1
Travel Time (Mean)	8.1 minutes	8.2 minutes
Trip Length (Mean)	2.0 miles	2.1 miles
Driver Assistance at Destination (Percent)		1.6
To physically help rider	8.1	7.8
To help with bags or open door only	12.2	
Total	20.3	9.4
Dwell Time (Origin and Destination) (Mean)	2.2 minutes	1.6 minutes
Fare (Mean)	\$1.68	\$1.68
Tip (Mean)	\$.06	\$.11
	(n=129)	(n=646)

SOURCE: Taxi on-board survey, May 1979.

somewhat more often* than rides by nonregistrants. This enabled taxi operators to attain additional economies in their operations, though the magnitude of this impact is difficult to measure precisely. Overall, however, it is evident that the general effect of the project was to increase patronage and revenues, and possibly decrease unit operating costs (through the shared-riding change), thereby leveraging contribution to overhead and profit.

This beneficial impact of the project is evident in the opinions and comments expressed by taxi operators. As shown in Table 6-2, operators were nearly unanimous in the opinion that the project had increased and improved their business. Furthermore, most of the firms with high project ridership levels believed that the bus portion of the subsidy program had no adverse impacts on the taxi industry since the two modes served primarily different markets.

The principal drawback of the program, cited primarily by the larger operators, involved the level of administrative effort required to organize and keep track of project tickets and submit them for reimbursement. For the larger firms, this effort amounted to upwards of one hour per day or more. Also, one operator noted that the tickets themselves were difficult to handle, and suggested use of a physically larger subsidy medium.

The project administration in general was well regarded, though the existence of a low level of abuse of project privileges (e.g., through "black market" resale of tickets) was acknowledged by some operators. Overall, however, none of these issues were of sufficient concern to the operators to discourage their participation in the project.

Specific impacts of the project on the operations of individual firms are generally difficult to discern. One impact that is evident is elimination by two firms (Park and Town) of their preproject special discounts for elderly and/or handicapped riders.** Clearly, this type of action tends to

*Difference not statistically significant at the 95 percent level of confidence.

**Merrimack also discontinued its discount program during the project. However, this change did not seem to be attributable to the project, since the discount had applied to all riders, and Merrimack handled a relatively small volume of project traffic.

TABLE 6-2. TAXI OPERATOR COMMENTS CONCERNING TRANSFARE PROGRAM

Company	Benefits	Subject Area				Average Project Ridership (Rides/month)	Project Ridership/Licensed Vehicle/month
		Bus - 14	Usage Limits	Paperwork	Abuse		
Allianza	-has more customers because taxis are cheaper now	-bad for business (didn't feel very strong about this point)				79	20
Arrow	-business is better -project is a good thing, gets people out	-not a problem	-no problem			147	73
South Union	-project riders need subsidy, wouldn't ride as much without it -would be difficult for firm to operate without program		-not too much extra work	-not much cheating		759	54
Town	-no increase in business, tickets substituted for cash -good intentions to help B&M, good project -would like to see user cost less than 50%	-unfair competition, buses have an edge	-takes 1+ hours/day			597	54
B&M	-project has helped business -good for older people, should be continued	-people who take buses not the same people who take taxis -bus subsidy not a problem	-tickets are a problem - time consuming	-some black market for tickets		1642	235

Table continued on following page.

TABLE 6-2. TAXI OPERATOR COMMENTS CONCERNING TRANSFARE PROGRAM

Company	Subject Area				Project Administration	Taxi Industry (General)	Average Project Ridership (Rides/month)	Project Ridership/Licensed Vehicle/month
	Benefits	Bus - 1¢	Usage Limits	Paperwork				
Park	-program has not affected business	-bus subsidy has had no effect on business	-no complaints	-no complaints	-not really a problem, serves the same people all the time so dispatcher is familiar with who is a project registrant	-needs more cars, loses day but cannot get the permits for them	239	60
Merrimack	-best program in Lawrence for elderly -brings more customers, more people are able to take taxi than before	-sometimes bus subsidy takes business away from taxi	-TRANSFARE does not explain well to customers how many trips they can take - seems to be some discrepancies -should lower age requirement to 50 years or older	-no complaints	-illegal ticket use not very common	-jitneys, illegal vans take customers away from taxi companies by offering lower fares, don't have to pay for licenses -would like to see more cooperation among taxi firms	83	12
Central/ Yellow	-people are riding more with tickets, has increased business -hope it continues	-taxi rider always uses a taxi and bus rider uses a bus - no conflict	-registrants would use taxi more if there were no limit, limit should be removed	-very time consuming, 8 hrs. to do 10 days worth of tickets	-very little abuse	-considering buying a van if project van kept busy -would like to see user-side subsidies in Methuen	4771	341
Plaza	-TRANSFARE has increased business, more rides from project registrants	-bus people get a better break but most taxi people cannot take buses, separate market	-if taxi people did not have limit they would take more rides E&H more mobility, but still not enough -taxi limit must be raised if fare increases	-no problem	-always ability to buy tickets "hot" -tickets are not used for recreational purposes	-very efficient, prompt, really cares about cab owners, "super" against program on basis of one-month consolidation	770	70

*Calculated from project records, July 1979 - June 1980.

SOURCE: Taxi operator interviews, August 1979.

offset the beneficial impacts of the discount program on registrant mobility (i.e., to the extent that the user side subsidy simply takes the place of preexisting discount plans offered by operators). However, given that these two firms collectively held less than 16 percent of the taxi permits in Lawrence, and carried less than 4 percent of total project ridership, the negative impact of these actions on registrant mobility was minimal.

As shown in Table 6-3, some relatively minor changes in the number of vehicles and permits held by different Lawrence taxi firms took place during the demonstration. While dramatic changes are not in evidence, it is noted that Central/Yellow and B&M, the two most intensive project participants, were the only firms to expand their vehicle fleets and/or number of permits (given that Plaza's apparent expansion simply reflects its acquisition of Frenchy's). It is important to note that factors such as the rapid exogenous fuel price escalation during 1979, as well as the increase in shared-riding levels under the regulatory changes associated with the project, acted to moderate the number of vehicles supplied and/or needed in service. Under these circumstances, changes in the number of vehicles in service may tend to understate the magnitude of the impact of the project on taxi demand, and its significance to the industry.

Other changes that occurred in the Lawrence taxi industry during the project were relatively minor and did not appear to be causally related to the project. For example, Plaza moved its base facility to a new location, which was equipped with a garage, while Town Taxi changed garage facilities and increased its number of phone lines. Also a number of firms made relatively minor staffing changes. However, none of these changes appear to be correlated with project-related factors. Overall, though, the project was very beneficial for taxi operators in Lawrence.

6.2 TRANSIT

In contrast with the experience of the taxi companies, the TRANSFARE project had generally mixed effects on the transit operator, Trombly, and its riders. As outlined in Chapter 5, the project did tend to enhance the mobility of transit users, with on the order of 40 percent of project bus rides (or 9 percent of all bus rides in Lawrence) corresponding to new trips associated with project-related travel frequency increases or modal diversions to bus.

TABLE 6-3. VEHICLES AND PERMITS HELD BY LAWRENCE TAXI FIRMS BEFORE AND DURING TRANSFARE PROJECT

NAME	NUMBER OF PERMITS		NUMBER OF VEHICLES	
	<u>7/78</u>	<u>8/79</u>	<u>7/78</u>	<u>8/79</u>
Merrimack	8	8	10	9
Arrow	2	2	3	2
Town	14	14	10	10
Plaza	9	12	12	14
Central/Yellow	14	14	12	13
Park	4	4	4	4
B&M	7	8	6	11
Alianza	4	4	4	4
Frenchy*	3	--	2	--
South Union**	<u>11</u>	<u>11</u>	<u>11</u>	<u>9</u>
Totals	76	77	74	76

*Frenchy was bought out by Plaza shortly after the program started.

**South Union became a participating firm in January 1979.

SOURCE: Taxi operator interviews.

In addition, these new project-related bus trips were particularly beneficial from an operational point of view, since, as shown in Table 6-4, project registrant ridership (and presumably project-related ridership growth) occurred disproportionately during off-peak hours, when additional passengers can be accommodated most easily.

However, neither the transit operator nor the Merrimack Valley Regional Transit Authority (MVRTA), the subsidizing agency, perceived that these benefits were large. In particular, the difference between fare levels of \$.01 and \$.15 was simply not believed to be a significant deterrent to travel by most user groups.

Furthermore, because Trombly was fully subsidized for its operating losses, project and project-induced ridership did not have a direct impact on the firm's financial performance, since revenues received in the form of redeemed project tickets simply offset farebox revenues and subsidies that otherwise would have been forthcoming. At the same time, project participation entailed at least some additional administrative effort (principally for ticket handling and counting) and increased auditing and monitoring requirements, burdens for which there was no tangible return for Trombly.

Similarly, from the MVRTA's perspective, the simultaneous application of user-side and provider-side subsidies increased monitoring and auditing requirements. These factors collectively explain the generally low level of enthusiasm exhibited for the project by the transit operator, and contributed to the MVRTA's decision to terminate the bus portion of the subsidy project in the post-demonstration phase (as described in Chapter 3).

6.3 SUMMARY

Overall, the user-side subsidy program in Lawrence was beneficial to taxi operators. It caused a significant increase in registrant taxi usage through increased travel frequencies and diversion of traffic from other modes. It also may have decreased unit operating costs through the change in regulations governing shared riding, and imposed only modest administrative costs. While transit ridership also increased, the impacts of the project on the transit operator were less favorable, primarily for administrative reasons.

TABLE 6-4. PERCENTAGE FORMED BY PROJECT REGISTRANTS OF TOTAL BUS RIDERSHIP BY TIME OF DAY

<u>A.M.</u>	<u>PERCENT PROJECT REGISTRANTS</u>
6-7	5.0
7-8	1.6
8-9	17.2
9-10	48.3
10-11	36.8
11-12	37.1
<u>P.M.</u>	
12-1	21.8
1-2	23.8
2-3	23.9
3-4	23.2
4-5	16.1
5-6	16.5
	(n=1597)

SOURCE: Transit on-board survey, May 1979.

7. NONTRAVEL IMPACTS

As outlined in the preceding chapters, the user-side subsidy demonstration in Lawrence had a variety of effects related to the travel behavior of project registrants and the providers of transportation services. In addition, however, the results of the demonstration shed light on some nontravel effects. These can usefully be classified into effects on social service agencies, project users, and firms and establishments, and are described in detail below.

7.1 SOCIAL SERVICE AGENCIES

It was originally anticipated that social service agencies might perceive the user-side subsidy program as an efficient and desirable alternative to their own transportation services, and consequently use the program to supplement or replace those services. Furthermore, for social service agencies that provided no transportation services, the user-side subsidy program was expected to promote access to the agency by its clientele, resulting in increased agency activity levels. In response, the agencies might assist their clients in arranging or paying for project trips, or even provide financial support for the program itself.

Prior to the beginning of the demonstration, however, agency attitudes toward the program were generally negative (see Table 7-1). Agencies indicated that, in most cases, the program would offer its clients little or no benefit. In particular, the program was criticized for several reasons:

- Limited geographical range of service;
- Unsafe taxi service;
- Poor marketing;
- Relatively high user charges (even with subsidy); and
- High cost of program.

Of the six agencies contacted, only one (Elder Services of the Merrimack Valley) saw significant merit in the Lawrence user-side subsidy program. The agency's director indicated that the program would likely serve the needs of Lawrence's elderly and handicapped far better than most of the agency providers. In fact, Elder Services planned to terminate its Title III (HEW) grant to the Greater Lawrence Community Action Council as of September 30, 1978, at least in part because the user-side subsidy program was considered a replacement for the agency-provided transportation service.

TABLE 7-1. PREDEMONSTRATION AGENCY ATTITUDES TOWARD SUBSIDY PROGRAM

<u>Agency</u>	<u>Potential Advantages</u>	<u>Potential Disadvantages</u>
Department of Public Welfare	Will provide clients assistance in making non-medical trips	Limited range of user-side subsidy service and poor marketing; taxis "inadequate" for providing transportation for the elderly and handicapped, primarily due to driver attitudes
Elder Services of the Merrimack Valley, Inc.	Excellent program; as a consequence, planned to terminate its Title III grant to Greater Lawrence Community Action Council's Elderly Transportation Program	Temporary (i.e., demonstration project) nature of program; potential adverse effect on Trombly's transit operations within the City of Lawrence; no special training for cab drivers
Greater Lawrence Chapter of the National Red Cross	None for its clientele	Limited range of transportation service provided; TRANSFARE service "inflexible"; also considered a waste of tax dollars
Greater Lawrence Community Action Council	None for its clientele	Taxi service poor, dangerous, and expensive; user-side subsidy concept severely criticized ("we can transport elderly people better than taxicabs")
Lawrence Council for Aging	Will assist those clients that agency can now transport only one way due to scheduling difficulties	User charges too high
Lawrence General Hospital Rehabilitation Center	None for its clientele	Limited range; limited number of trips per month; taxi drivers inconsiderate and "maniacal"

SOURCE: Social service agency interviews.

Once the demonstration began, agency involvement was somewhat higher than might be expected based on pre-demonstration agency attitudes. Several agencies distributed TRANSFARE promotional materials, and many also provided client referrals. Elder Services did not renew its grant to the Greater Lawrence Community Action Council for transportation services for the elderly, and instead referred clients to the project. Also, the Department of Public Welfare, as part of its larger transportation cost-cutting effort described in Chapter 3, urged its eligible clients to join and make use of the TRANSFARE program (particularly the bus portion) to fulfill their transportation needs, with the agency continuing to reimburse the clients' out-of-pocket transportation costs. This produced a sufficient response on the part of agency clients to evoke complaints from two taxi operators that their business was being hurt by the diversion of previously subsidized taxi trips to buses.

It is important to note that the only agency that clearly changed its transportation program in response to the project (Elder Services) had previously contracted with an outside supplier for transportation services, and had no in-house transportation programs. This is also true of the Department of Public Welfare, to the extent that any part of its transportation cost-cutting program could be attributed to the existence of the user-side subsidy project. The TRANSFARE program enabled these agencies to reduce their transportation expenditures substantially without sacrificing the types of benefits that might accrue to other agencies through in-house control over the provision of transportation services.

In general, however, Lawrence's social service agencies took little or no active role in program registration, trip scheduling, or funding. Given the original expectations concerning the role of social service agencies in the context of the subsidy program, it is important to account for this lack of agency participation. For agencies that did not provide their own transportation services, participation in the program would have required new expenditures. Budget limitations may have precluded these additional expenditures, or the higher levels of agency activities that could be caused by project-induced trips. For agencies that did provide transportation services, the true cost per trip might have been lower using the subsidy program. However, a lack of rigorous cost accounting may have contributed to a general lack of awareness on the part of these agencies of cost differentials.

Other potential causes for the lack of agency participation include the following:

1. Service -- The clients of some agencies had specialized service requirements in terms of equipment or responsiveness (e.g., ambulances) that could not be met by ordinary taxis. Direct agency control over the selection and operation of equipment ensured that these requirements were met. It is noted that the lift-equipped van portion of the TRANSFARE program had the potential to circumvent at least some service-related objections to conventional taxi and bus service. However, as outlined in Chapter 3, the van program was terminated by the service provider before the full range of its potential effects and uses could reliably be assessed.
2. Nondiscrimination -- The service areas of five of the six agencies were larger than the area covered by the subsidy program. Agency support of the project or project trips would therefore have amounted to a differential in the overall quality of service offered to agency participants, at least to the extent that other communities did not offer similar programs.
3. User Cost -- Even with a 50 percent subsidy, the cost to the users of conventional taxi service was still often greater than that of agency transportation, a problem cited by a number of agencies. Also, the requirement that users purchase tickets in advance was perceived by some agencies to be a problem.
4. Marketing -- Agencies that provided transportation services may have placed a value on the positive effects that service had on the attitudes of clients towards the agency and may not have wanted to forego that benefit.

7.2 PROJECT USERS

Users of project subsidies incurred both costs and benefits as a result of the program. Costs included the effort required to register for the program and obtain discount tickets. However, given the small geographical size of Lawrence, these costs were generally not significant compared to the benefits produced by the subsidy itself.

Aside from the travel benefits described in Chapter 5, users of project subsidies received two distinct types of nontravel benefits as a result of the program. First of all, there was a gain in welfare experienced by individuals who increased their travel frequency and would have been willing to pay more than the subsidized fare (but less than the unsubsidized fare) to make the new trip(s). For these individuals the project created new travel opportunities, which, when taken advantage of, made the individuals better off.

The second, and somewhat more tangible, benefit received by project participants, was the reduction in fares for trips they would have made anyway. This was essentially a transfer payment that increased the users' disposable income net of travel. Since the portion of subsidy payments that accrued in this manner is equal to one minus the fraction that project-related increases formed of total project ridership, it can be seen that on the order of 50 percent or more of the project subsidy payments amounted to income transfers. These may have been significant income supplements for some project registrants.

Friends, relatives, and cohabitants of project users received indirect benefits from the project. To the extent that registrants used the project discount to take trips that previously would have been taken as a passenger in someone else's auto, for example, the project reduced the requirements placed on those other ride sources. Project users themselves may have benefited psychologically from an increased level of independence.

7.3 FIRMS AND ESTABLISHMENTS

It is reasonable to assume that the changes in travel behavior outlined above had effects on the levels of activities of different firms and organizations. For example, increases in the frequency of shopping trips imply increases in the level of retail activity, at least for the stores with a significant elderly and handicapped clientele. This effect may have been further magnified by the "income effect" described above, which essentially provided users with more disposable income by reducing the cost of transportation, in addition to allowing them more frequent visits to retail areas. Overall, the increased mobility and income of subsidy users can be assumed to have led to increased activity levels, at least for establishments that served as the destinations for project trips.

8. SUMMARY AND TRANSFERABILITY OF FINDINGS

The Lawrence user-side subsidy demonstration tested an innovative approach to the task of increasing the mobility of the elderly and handicapped. From this test, as outlined in the preceding chapters, numerous observations concerning the operation and effects of the subsidy program in the local setting have been made. When assessing the potential merits of user-side subsidy programs in other areas, however, it is necessary to account for the effects that the characteristics of the local setting and the demonstration itself had on observed results. Therefore, in this chapter, relationships between the impacts of this demonstration and site- and project-related factors are developed. Based on these relationships, the potential effects of user-side subsidies for the project modes at other sites, the potential for improvement in the subsidy program as applied in Lawrence, and various other considerations are discussed.

8.1 TAXI

The effects of the taxi portion of the Lawrence user-side subsidy demonstration project were almost uniformly positive for project registrants and for the taxi industry. Eligible individuals were able to register for the project and procure the tickets needed to make use of project discounts without significant difficulty despite the use of a single registration/ticket sales location. Project use grew steadily from the outset and reflected at least a modest increase in the mobility of project registrants (who tended to come from the most mobility-disadvantaged segments of the eligible population) in the form of trips that would not have been made in the absence of the subsidy program, as well as trips that were diverted from other less preferred modes of travel.

Of course, it is by no means assured that the same results can be achieved at other sites. For example, in larger and/or less densely settled areas, where transit coverage and access to the project office are restricted, use of a single location for registration and ticket sales may not be feasible. In such areas, use of such options as satellite locations, or ticket sales by mail, may be warranted.

Likewise, factors beyond the control of the project that were related indirectly to the ability of the project to produce mobility improvements in Lawrence, such as short intracity travel distances that make taxis a viable travel alternative, and the existence of a large number of relatively small taxi firms, which tends to preserve service competition, may not be present in other settings. In the absence of such factors, expectations concerning the ability of a user-side subsidy program to enhance the mobility of target individuals would have to be reassessed.

The principal drawback observed in registrant use of the taxi portion of the Lawrence user-side subsidy program involved abuse of project privileges by a very small number of registrants, who used larger quantities of project tickets than were permitted under the project's nominal usage limits. This overuse, though quite limited in magnitude, could occur at least in part because of the informal administrative methods used to monitor the project usage rates of individual registrants.

At other sites, or even in Lawrence, this experience suggests that consideration of more reliable administrative methods may be warranted. For example, project ticket sales could be recorded by registrant ID number rather than chronologically. Of course, given that the overusers observed in Lawrence were among the most mobility-disadvantaged of all project registrants, institution of tighter administrative methods might well be accompanied by a formal policy of granting waivers of the usage limit to exceptionally needy individuals. While there is an element of circular reasoning to this approach (i.e., detect the overusers so that they can be granted waivers), the fact that the methods used in Lawrence could not detect sustained overuse suggests that alternative methods are worthy of investigation and consideration.

Since the end of the federal demonstration, the Lawrence program has eliminated the limit of four trips per week, and has replaced it with a purchase limit of six coupon books per month. This restriction is much more easily monitored.

It should also be emphasized that despite the informal administrative methods used in Lawrence, the vast majority of registrants were aware of the usage limits and only used the project within those limits. Unfortunately, there is no way to determine whether the limited overuse that did occur represented an excessive number of trips actually taken by offending registrants, whether the registrants were reselling

the tickets in the sort of "black market" alluded to by more than one of the taxi operators, or whether the registrants were even fully aware of the usage limitation.

For the taxi companies, the beneficial impacts of the program are most evident in the fact that the program was able to enlist and maintain the support of all taxi operators in Lawrence. The most obvious benefit received by the taxi operators was the increase in patronage and revenues realized from project-related increases in taxi usage by registrants. Given that project and nonproject rides consumed comparable levels of resources, the increase in patronage and revenues translated into an increase in profitability. This can be expected to occur at other sites to the extent that conditions are favorable for the underlying mobility improvements, as described above. Also, it is noted that there may be differences at other sites in the ability of taxi operators to handle the administrative and financial burdens that may be associated with a user-side subsidy project. For example, companies based on associations of "owner-drivers" (as contrasted with the commission/employee drivers in Lawrence) may experience greater cash-flow difficulties related to delays in project reimbursement than the Lawrence firms, since the Lawrence firms were able to diversify cash flows and risks to some extent across their fleets. In addition, the levels of staff resources, flexibility, and adaptability in Lawrence taxi firms differ substantially from the more skeletal management structures found in the taxi firms of some other cities. Such differences may inhibit the ability of taxi firms in some cities to comply with project administrative requirements in a full and efficient manner.

Additional benefits were realized by Lawrence taxi operators through the removal of restrictions on shared riding as part of the project. This provided operators with much greater flexibility in the handling of service requests (project and nonproject), and provided opportunities for efficiency improvements that the operators took immediate advantage of, producing only slight degradations in such service quality measures as wait times* and ride times.

*Theoretically, wait times could improve after a relaxation of restrictions on shared riding, as more vehicles are potentially available to handle a given service request. However, to the extent that dispatchers delay the assignment of trips to vehicles in order to enhance the likelihood of shared riding, opportunities for improving wait times tend to be diminished.

A number of factors may have contributed to the realization of benefits from the expansion of shared-riding activity in Lawrence. These factors include the following:

- Lawrence's geographically small, dense area produces many opportunities for shared riding;
- Exogenous changes in fuel prices during the project increased the importance to operators of improving efficiency through all available means;
- Lawrence's preexisting zonal fare system provided a consistent and equitable method for determining fares, given that passengers may experience substantial circuitry during shared riding; and
- Lawrence's taxi firms generally had full-time dispatching support that enhanced their ability to group rides in real time for the purposes of shared riding.

At other sites, it should be anticipated that there may be differences in the extent to which a relaxation of shared riding restrictions can be exploited. For example, it must be recognized from the outset that all firms are not equally capable of grouping rides in real time, and that an appropriate fare structure is needed.

It is important to note that the changes in service quality associated with increased shared riding in Lawrence applied equally to project and nonproject rides. Operators perceived no difference between the attractiveness of project and nonproject trips, and did not attempt to differentiate the quality of service offered to project and nonproject users. However, at least two operators did cancel preexisting fare discount plans for elderly and handicapped riders in light of the magnitude of the project subsidy. While these discounts had only been effective in a small percentage of the total taxi industry in Lawrence, the existence of such discounts must be carefully considered when the applicability of user-side subsidies is considered at other sites. Clearly, to the extent that a user-side subsidy project simply involves reimbursing an operator for fares the operator was already willing to forego as part of a private marketing effort, a greater portion of project subsidies tends to accrue as revenue-enhancement measures for operators, and a lesser portion accrues in the form of net user benefits.

Overall, the taxi portion of the user-side subsidy program in Lawrence had modest but positive effects on registrant mobility, which, in combination with the opportunities for efficiency improvement created by the removal of restrictions on shared riding, led to positive effects on taxi operations and profitability. The positive nature of these net effects is reinforced by the continuation of the taxi portion of the project under local sponsorship in the post-demonstration phase. However, a number of additional factors must be considered before it can be concluded that similar effects would result at other sites.

8.2 BUS

As was the case with the taxi portion of the Lawrence user-side subsidy project, registrants were able to obtain tickets and make use of the project subsidies without any major problems. This, again, led to measurable improvements in user mobility even beyond the level associated with the already-discounted fare structure that applied to the target population prior to the project.

However, in contrast with the taxi portion of the program, the bus portion was not fully endorsed by the transit operator. In general, it was believed by the operator that the mobility benefits produced by a fare reduction from \$.15 to \$.01 were minor at best for most users. Furthermore, administration of the user-side subsidy represented a particular burden in Lawrence, given that the transit operator was a private contractor operating on a net cost-reimbursement basis. Because the transit operator was fully subsidized for its operating losses, project and project-induced ridership did not have a direct impact on the firm's financial performance, since revenues received in the form of redeemed project tickets simply offset cash revenues or subsidies that otherwise would have been forthcoming. At the same time, project participation entailed at least some additional administrative effort (principally for ticket handling and counting), and increased auditing and monitoring requirements for the transit operator and its subsidizing agency, burdens for which there was no tangible return on either.

At other sites, it is reasonable to expect that user-side subsidies for buses will have a higher perceived value when transit fare levels are higher, so that more significant mobility changes might result from the effective fare change. Also, the perceived burden of auditing and monitoring

requirements may be reduced if the transit operator is a public agency (rather than a private contractor), though any case in which provider-side and user-side subsidies are being administered simultaneously raises important issues concerning the cost-effectiveness of the resulting high levels of administrative effort. Of course, these issues do not exist in the case where the transit operator is a private entity operating bus service at a profit (without subsidies). However, given that this latter case rarely obtains in practice, the experience of the bus portion of the Lawrence user-side subsidy program serves to illustrate at least some of the limiting factors that must be addressed when this concept is considered for application in other areas.

8.3 LIFT-EQUIPPED VAN

Because of the circumstances surrounding the termination of the Lawrence van program, it is difficult to assess fully the transferability of this concept to other sites. Eligible individuals were able to register for and make use of the service in Lawrence without major problems. However, as described previously, the service provider withdrew from the program approximately 7 months after it began.

Two obvious potential factors in the decision of the provider to withdraw from the program are the following:

- 1) The rapid increase in operating costs that occurred during the time of van program operation and likely eroded the profitability of van trips; and
- 2) The existence of demand from other sources for van services that reimbursed at higher rates than TRANSFARE.

Both of these factors imply that higher fare levels would likely have sustained the continuation of the van program in 1979. This is substantiated by the experience of the MVRTA, which was able to restart the van program under local sponsorship in March 1981 with higher fare levels and a total of five service providers (including the original provider from the demonstration phase). By early 1984, the van program had 500 registrants and was carrying some 350 to 400 trips each month. A neighboring city has started a similar van service following pressure from local handicapped groups, who cited the value of the Lawrence program.

A van program of this type is a logical supplement to user-side subsidies for taxi and/or bus, given the special mobility needs of severely handicapped individuals. In many respects, a van program of this type is uniquely suited to overcome at least some of the objections typically raised by social service agencies regarding nonagency transportation services. However, the Lawrence demonstration does not form a sufficient basis for drawing firm conclusions in this area, or in the area of the impact of this type of van program on registrant mobility, both of which must be left for further research.

8.4 USE OF TICKETS VS. VOUCHERS

The Lawrence demonstration illustrated some of the important differences between tickets and vouchers as administrative mechanisms for user-side subsidies. For example, vouchers contain an inherently higher degree of documentation of project trips than do tickets. Tickets may therefore be more susceptible to certain types of misuse (e.g., "black market" resale of tickets by registrants) than vouchers. Also, it should be noted that the higher degree of documentation associated with vouchers may facilitate third-party billing to outside (e.g., social service) agencies. Vouchers can be used to identify the trips that are eligible for billing to other agencies, while tickets, unless they are sold directly to the agency, cannot generally be used in this manner.

The use of tickets necessarily entails distribution costs for the subsidy manager that are not encountered with vouchers. Provision must be made for public sale/distribution of tickets to registrants prior to their use. In Lawrence, these costs were not large, as a single ticket sales location was used. Nevertheless, they are costs that are not incurred with vouchers.

Tickets also impose costs on users. These costs arise from both the effort required to procure tickets (in Lawrence, from the single ticket distribution point), and from the "carrying cost" of a ticket inventory. These factors may be particularly onerous for infrequent users and/or when per-ride user charges are high (as in the van portion of the Lawrence subsidy program). While there may be a tendency to view infrequent use as reflecting a lack of utility of the project

for registrants, it is important to note that vouchers facilitate low-frequency project use, and may expand the appeal and usefulness of a user-side subsidy project for infrequent riders.

Tickets do entail less effort than vouchers for both service providers and passengers at the time a trip is taken. Likewise, tickets typically involve less administrative handling at the time of redemption. They also provide the capability to limit program costs and target program subsidies through the distribution/sales mechanism.

Overall, tickets tend to have an advantage over vouchers in cases in which use is very frequent, fraud incentives and opportunities are limited, and a sufficient scale of operation exists to support an economical ticket distribution arrangement. These factors are evident in the general success of tickets as a subsidy medium in the taxi and bus portions of the Lawrence subsidy program. Conversely, vouchers tend to have an advantage when the frequency of project utilization is so low that the effort required to fill out vouchers and check their validity is low relative to the costs of a ticket system. The Lawrence handicapped van service, for example, appears to be a particularly appropriate application setting for vouchers.

8.5 TAXI/BUS COMPETITION

Project registrants in Lawrence could generally make a choice between subsidized bus and subsidized taxi service.* As outlined above, registrants made considerable use of both project services. While the number of project bus rides exceeded the number of project taxi rides by approximately a 2:1 ratio, comparable numbers of registrants made use of each portion of the program. These individuals were typically able to realize improvements in their mobility through both modes, either in the form of new trips, or trips that previously would have been made using a less preferred mode.

Since neither mode was clearly "preferred" over the other, it is relevant to examine the submarkets of project registrants to which each mode appealed. Taxi (only) and taxi and bus

*Given the temporary nature of the van service and the specialized character of its eligible individuals, this discussion focuses on bus and taxi use only.

users generally had the highest incidence of handicaps (including nonelderly handicapped), and tended to be females. They had the lowest incomes and fewest ride sources (driver's licenses, vehicles in household) among registrant groups. On the other hand, bus (only) users had a higher representation of males, slightly higher incomes, lower handicap levels, and somewhat more ride sources. Registrants who did not utilize project discounts at all had the fewest handicaps, highest incomes, and most ride sources of all registrants. While some of these types of differences may have been expected, it must be left to future research to determine whether sufficiently reliable relationships exist to enable forecasts of modal utilization to be derived from the experience of this and other user-side subsidy projects.

8.6 CONCEPT APPLICABILITY IN LARGER SETTINGS

The results of the Lawrence demonstration shed some light on issues surrounding the application of user-side subsidies in settings that are large in terms of area and population. While Lawrence itself encompasses a small land area with a relatively small population, it does possess the density characteristics of some larger areas, and the ability of the project to operate smoothly from a single site implies that operations in somewhat larger settings are at least technically feasible. However, reliable estimation of the range of geographical sizes for which these administrative arrangements are most appropriate is not feasible at this time.

In general, as service area population increases, a number of factors must be taken into account. First, as the volume of project activity increases, it becomes even more important that project administrative mechanisms be efficient and effective. Furthermore, opportunities for fraud increase as the population increases and fewer administrative checks can effectively be applied. Under these circumstances, some of the administrative methods used in Lawrence, particularly the manual monitoring of ticket purchases to ensure that project usage limits were not violated, would almost certainly need to be modified if the concept were applied in a larger area. However, the demonstrated ability of the Lawrence program to distribute subsidies efficiently to the target market at reasonably low costs to users and service providers suggests that the applicability of the concept in larger areas is worthy of further investigation.

APPENDIX A. EVALUATION OVERVIEW

APPENDIX A. EVALUATION OVERVIEW

The information and analysis presented throughout this report is based on a series of data collection efforts conducted by the local project staff that were designed to monitor all of the potential effects of the demonstration project described above. For the most part, the data collection was structured in a "before-and-after" framework to identify changes that took place with the implementation of the demonstration. The before-and-after observations have been supplemented by monitoring exogenous events and indicators of site activity to facilitate the interpretation of before/after changes and enhance the credibility of findings.

Specific evaluation activities included the following:

1. Site data collections;
2. Registration interviews;
3. Taxi on-board surveys;
4. Taxi operator profiles;
5. Transit on-board surveys;
6. Transit operator profiles;
7. Travel diary surveys;
8. Social service agency profiles;

9. A follow-up survey of project registrants;
10. A survey of nonregistrants;
11. Tabulation of taxi ticket returns;
12. Tabulation of bus ticket returns;
13. Tabulation of handicapped van service vouchers; and
14. Administrative cost accounting.

For each of these activities, a brief description, along with survey instruments and sampling plans as appropriate, are presented below.

1. SITE DATA COLLECTION

Various measures were collected to provide a description of the demonstration site, assist in identifying the location and distribution of the target population, describe local travel patterns, monitor exogenous changes, and aid in the transfer of results. Specific data items included aggregate demographic characteristics, geographical features, land-use distributions, locations of residential and activity centers, and indicators of the local economic and climatological conditions. These data were gathered from a variety of sources, including the Bureau of the Census and the Planning Department of the City of Lawrence.

2. REGISTRATION INTERVIEWS

Whenever an individual registered for the TRANSFARE program, an interview was conducted to gather socioeconomic data describing the individual and his/her household, as well as various travel-related characteristics. A copy of the standard Registration Interview Form is presented in this appendix.

3. TAXI ON-BOARD SURVEYS

Taxi on-board surveys were administered before and during the demonstration to gather information describing project (eligible) and nonproject riders and the types of trips they

made. The surveys were conducted over a four-week period to eliminate daily or weekly biases, and since the before-and-after surveys were each conducted at the same time of the year, seasonal biases were compensated for as well. In May 1978, a total of 615 interviews were conducted, while in May 1979, there were 1187 interviews of taxi riders. A copy of the Taxi On-Board Survey Form is included in this appendix.

4. TAXI OPERATOR PROFILES

For each taxi firm participating in the subsidy program, a comprehensive description of predemonstration operations, covering vehicles and facilities, service policies, operating policies, etc., was developed on the basis of personal interviews conducted in July 1978. In August 1979 a second round of interviews was conducted to detect and investigate significant changes that had taken place during the demonstration.

5. TRANSIT ON-BOARD SURVEYS

Transit on-board surveys were administered before and during the transit portion of the subsidy program to gather information describing project and nonproject riders and their trips. In each case, interviewers were selected to ride in vehicles in a manner that resulted in an approximately random assignment across available vehicle hours. The surveys were conducted over a four-week period to eliminate daily or weekly biases. In May 1978 a total of 1,954 interviews were conducted, while in May 1979 there were 1,597 interviews of bus riders. A copy of the Transit On-Board Survey Form is included in this appendix.

6. TRANSIT OPERATOR PROFILES

In June 1978, a comprehensive description of the local transit system in Lawrence (Trombly Motor Coach), including operations, vehicles, and facilities, was developed on the basis of personal interviews. In August 1979, a second round of interviews was conducted, including the Merrimack Valley Regional Transit Authority (MVRTA), to detect and investigate significant changes that had taken place during the demonstration.

7. TRAVEL DIARY SURVEYS

A survey of 285 project-eligible individuals was conducted in May 1978 that involved respondent-maintained tabulation and description of each trip taken during a four-week period. This survey was repeated in May 1979 with 251 respondents, most of whom also participated in the first round. Analysis and documentation of the results of these surveys has been conducted by the Transportation Systems Center (TSC).

8. SOCIAL SERVICE AGENCY PROFILES

For six social service agencies in Lawrence at the beginning of the demonstration, profiles of agency activities, transportation services, and attitudes toward the user-side subsidy program were constructed on the basis of personal interviews conducted in June 1978. In November 1980, a second round of interviews was conducted to detect and investigate any changes that had taken place during the demonstration.

9. FOLLOW-UP SURVEY OF PROJECT REGISTRANTS

In July 1980, a sample of 251 project registrants, selected randomly from the 4,529 project registrations completed prior to that time, were contacted by telephone. This survey investigated changes in the characteristics of registrants since the time of their registration that might have affected their travel behavior, changes in travel behavior they attributed to the TRANSFARE program, the level of service experienced on TRANSFARE and nonTRANSFARE taxi rides, difficulties experienced in using the subsidy program, and reasons why they did not use the program more. A copy of the Follow-Up Survey of Project Registrants is included in this appendix.

10. TELEPHONE SURVEY OF NONREGISTRANTS

The purpose of this survey was to investigate the socioeconomic and travel characteristics of individuals who were eligible for the TRANSFARE program but chose not to register, as well as their reasons for nonparticipation. Differences between registrants and nonregistrants are particularly important in explaining project market penetration rates and assessing the transferability of the subsidy concept to other sites. For this survey, a sample of names was drawn randomly from the Lawrence

telephone directory (using a random start/constant skip interval) and contacted by telephone. Since eligible and noneligible individuals could not be distinguished prior to telephone contact, a large number of calls had to be made to yield the final sample of 244 eligible nonregistrants. A copy of the Telephone Survey of Nonregistrants is included in this appendix.

11. TABULATION OF TAXI TICKET RETURNS

To monitor project taxi usage, the project staff maintained records of the project trips taken each month based on returned tickets. This information facilitated analysis of the factors affecting project use rates.

12. TABULATION OF BUS TICKET RETURNS

To monitor project bus usage, the project staff maintained records of the project trips taken each month based on returned tickets. This information facilitated analysis of the factors affecting project use rates by different individuals.

13. TABULATION OF HANDICAPPED VAN SERVICE VOUCHERS

To monitor project van usage, the project staff maintained records of project trips taken each month based on returned vouchers.

14. ADMINISTRATIVE COST ACCOUNTING

To facilitate analyses of project administrative costs and the skills required for different tasks, the time spent by different staff members working on different administrative activities and other project-related expenses were tabulated for a sample of time periods.

REGISTRATION INTERVIEW FORM

Department of Community Development
 City of Lawrence
 User-Side Subsidy Program
 Project Registration Interview

Code Col 1-2:

1	2
0	1

ID #:

3	4	5	6	7

Social Security No.:

8	9	10

11	12

13	14	15	16

17

Date:

18	19	20	21	22	23

Interview Location:

24	25

Applicant Name:

26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	

Address:

48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	

Zip Code:

66	67	68	69	70

Phone Number:

71	72	73	74	75	76	77

Interviewer Code:

78	79

Code Col 1-2:

1	2
0	2

Code Resp. ID:

3	4	5	6	7

1. What is your age? _____ years.

2. Sex (INTERVIEWER RECORD FROM OBSERVATION)

1) ___ Male 2) ___ Female

3. Race (INTERVIEWER RECORD FROM OBSERVATION)

1) ___ White 2) ___ Black 3) ___ Other

4. What is your marital status?

1) ___ Single 2) ___ Married

3) ___ Formerly married (widowed, divorced, or separated)

8	9	10

11

12

13

5a. Do you have a physical handicap?

1) ___ Yes 2) ___ No

14

5b. (IF YES) Can you describe the handicap?

CODE HERE THE NUMBER OF THE HANDICAP ELIGIBILITY CLASS ASSIGNED THIS INDIVIDUAL:

15 16

6a. Do you require any special aids for movement?
(DO NOT PROBE; CHECK ALL THAT APPLY)

1) Yes ___ 2) No ___ Handicapped, but no aids

17

1) Yes ___ 2) No ___ Wheelchair

18

1) Yes ___ 2) No ___ Walker

19

1) Yes ___ 2) No ___ Crutches

20

1) Yes ___ 2) No ___ Cane (for walking)

21

1) Yes ___ 2) No ___ Cane (for blind person)

22

1) Yes ___ 2) No ___ Car with special controls

23

1) Yes ___ 2) No ___ Seeing-eye dog

24

1) Yes ___ 2) No ___ Artificial limbs

25

1) Yes ___ 2) No ___ Braces

26

1) Yes ___ 2) No ___ Another person

27

1) Yes ___ 2) No ___ Other

28

1) Yes ___ 2) No ___ No handicap

29

6b. Do you have any difficulty performing any of the following activities?
 (ASK EACH AND CHECK ALL THAT APPLY)

- | | | | |
|------------|-----------|--|--------------------------------|
| 1) Yes ___ | 2) No ___ | Walking more than one block | 30
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Climbing a flight of stairs or escalator | 31
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Boarding or leaving from a standard bus | 32
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Standing in a moving bus | 33
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Sitting down or getting up | 34
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Reading information signs | 35
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Hearing announcements | 36
<input type="checkbox"/> |

7a. Do you have a current driver's license?

- | | | |
|------------|-----------|--------------------------------|
| 1) Yes ___ | 2) No ___ | 37
<input type="checkbox"/> |
|------------|-----------|--------------------------------|

7b. When did you last drive?

- | | | |
|--------|----------------------|--------------------------------|
| 1) ___ | Within past month | 38
<input type="checkbox"/> |
| 2) ___ | Within past 3 months | |
| 3) ___ | Within past year | |
| 4) ___ | More than 1 year | |
| 5) ___ | Never drove | |

8. What is your employment status?
 (DO NOT PROBE, CHECK ALL THAT APPLY)

- | | | | |
|------------|-----------|--------------------|--------------------------------|
| 1) Yes ___ | 2) No ___ | Employed full-time | 39
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Employed part-time | 40
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Unemployed | 41
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Retired | 42
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Student | 43
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Homemaker | 44
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Other | 45
<input type="checkbox"/> |

9. (HAND RESPONDENT INCOME RESPONSE CARD)
 Could you please tell me the letter of the category
 which best describes your personal income last year?
 (1977 before taxes)

- A. Less than \$3,000 ___ (1)
- B. \$3,000-\$4,999 ___ (2)
- C. \$5,000-\$7,999 ___ (3)
- D. \$8,000-\$11,999 ___ (4)
- E. \$12,000-\$14,999 ___ (5)
- F. \$15,000-\$20,000 ___ (6)
- G. Over \$20,000 ___ (7)
- H. Refused ___ (8)
- I. Don't know ___ (9)

(Code number
 of response)

46

10. How many persons (including yourself) maintain a
 residence in your household? _____

47	48
----	----

11a. How many persons in your household are 65 years
 of age or over (including yourself if applicable)?

49	50
----	----

11b. How many of these persons (over 65) have some
 physical handicap that restricts their travel?

51	52
----	----

12. How many persons in your household are under 65
 years of age and handicapped (including yourself
 if applicable)? _____

53	54
----	----

13. How many vehicles (automobiles, vans, etc.) are
 owned by your household? _____

55	56
----	----

14. How many drivers are there in your household
 (including yourself)? _____

57	58
----	----

(Code number
 of blocks)

15a. How far do you live from the nearest bus stop?
 (TRY TO OBTAIN ANSWER IN BLOCKS; 1 MILE = 8 BLOCKS)
 _____ blocks

59	60	61
----	----	----

15b. (IF RESPONSE (1) OR (2) TO QUESTION 15a)
 How long does it take to walk there? _____ minutes

62	63
----	----

Code Col 1-2:

1	2
0	3

 Code Resp. ID:

3	4	5	6	7

16a. (HAND RESPONDENT INFORMATION SOURCE CARD)
 Through which of the means listed on this card did you hear of or learn about the discount program?
 (CHECK ALL THAT APPLY)

- | | | | |
|------------|-----------|--|--------------------------------|
| 1) Yes ___ | 2) No ___ | Newspaper | 8
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Television | 9
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Radio | 10
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Friend or relative | 11
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Social or Welfare Service Agency (includes Medical Clinic, Rehabilitation Workshop, or Doctor) | 12
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Employer | 13
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Religious organization | 14
<input type="checkbox"/> |
| 1) Yes ___ | 2) No ___ | Other | 15
<input type="checkbox"/> |

16b. Which was the most important in convincing you to register for the program? (CHECK ONE ONLY)

- 1) ___ Newspaper
 - 2) ___ Television
 - 3) ___ Radio
 - 4) ___ Friend or relative
 - 5) ___ Social or Welfare Service Agency (includes Medical Clinic, Rehabilitation Workshop or Doctor)
 - 6) ___ Employer
 - 7) ___ Religious organization
 - 8) ___ Other
- 16

17. (HAND RESPONDENT INCOME RESPONSE CARD)
Could you please tell me the letter of the category that describes the combined annual income (1977 before taxes) of all members of your household (including yourself)?

- A. Less than \$3,000 ___ (1)
B. \$3,000-\$4,999 ___ (2)
C. \$5,000-\$7,999 ___ (3)
D. \$8,000-\$11,999 ___ (4)
E. \$12,000-\$14,999 ___ (5)
F. \$15,000-\$20,000 ___ (6)
G. Over \$20,000 ___ (7)
H. Refused ___ (8)
I. Don't know ___ (9)

(Code number
of response)

17

18. Now, to complete this interview, I'd like to ask you some questions on your travel, specifically about your travel in the Lawrence area yesterday. I'd like you to think back carefully over what you did and where you went yesterday. When you think you remember, I'd like you to give me a list of each of these places you went, starting in order with the first trip of the day.

I'd like to know everyplace you went outside your home, even if it was only visiting a neighbor's house 3 doors down, or taking a walk around the block.

INTERVIEWER: MAKE A SCRATCH LIST OF ALL TRIPS MADE YESTERDAY. REFER BACK TO THIS LIST LATER WHEN PREPARING THE TRIP SUMMARY TO CHECK FOR OMISSIONS.

AFTER YOU HAVE ASSEMBLED THE SCRATCH LIST, PROCEED TO GET THE NECESSARY DETAILS ON EACH TRIP BY ASKING QUESTIONS A THROUGH F.

A. Where did your first trip to (STATE PURPOSE OR PLACE) start?

(Description and address, if possible)

Code Col 1-2

0	4
---	---

Code Resp. ID:

--	--	--	--	--	--

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Code Total

19	20
----	----

Trips

--	--

REPEAT QUESTIONS B-G
FOR EACH TRIP LISTED.

RECORD ALL
RETURN-HOME TRIPS.

- B. And then where did you go?
- C. For what reason(s) did you go there?
- D. By what means did you travel?
- E. About what time did your trip start?
- F. How many other people accompanied you on this trip?
(Ask question G only if person travelled by auto)
- G. Was the vehicle you travelled in owned by your household?

Code Card No.	Code Resp ID	B		C	D	E	F	G
		Place Travelled to: (Description and address if possible)	Purpose of Trip	Method of Travel	Trip Start Time	Number of Other People on Trip	Household Vehicle	yes no
05	<input type="text"/>				: am/pm		1	2
06	<input type="text"/>				: am/pm		1	2
07	<input type="text"/>				: am/pm		1	2
08	<input type="text"/>				: am/pm		1	2
09	<input type="text"/>				: am/pm		1	2
10	<input type="text"/>				: am/pm		1	2
11	<input type="text"/>				: am/pm		1	2
12	<input type="text"/>				: am/pm		1	2
13	<input type="text"/>				: am/pm		1	2
14	<input type="text"/>				: am/pm		1	2
15	<input type="text"/>				: am/pm		1	2
16	<input type="text"/>				: am/pm		1	2
17	<input type="text"/>				: am/pm		1	2
18	<input type="text"/>				: am/pm		1	2
19	<input type="text"/>				: am/pm		1	2

Cols: (1-2) (3-7) (8-9) (10-20) (21-22) (23) (24-29) (30-31) (32)

TAXI ON-BOARD SURVEY FORM

CITY OF LAWRENCE TAXI SURVEY

CAB OPERATING INFORMATION

Form TAXOB-1

Coding Column
(Code 9 in each
column for
missing value.)

Batch No. _____ (Col 1-2)

Blue Sheet No. _____ (Col 3)

Pink Sheet No. _____ (Col 4-5)

1. Is this ride shared with the previous ride? _____ (Col 6)
(1) _____ Yes (2) _____ No

2. Time of trip assignment _____ (Col 7-10)
AM
PM
Code four
digits (24
hour clock)

3. How assigned: _____ (Col 11)
(1) _____ Person at cab (3) _____ Call -- immediately
(2) _____ Person hailed cab (4) _____ Call -- appt.

4. Appointment Time: _____ (Col 12-15)
AM
PM
Code four
digits (24
hour clock)

5. Mileage at Assignment _____ (Col 16-19)
Code last four
digits (including
tenths)

6. Time arrives origin: _____ (Col 20-23)
AM
PM Code four
digits (24
hour clock)

7. Mileage at origin: _____ (Col 24-27)
Code last four digits
(including tenths)

8. Does driver get out of cab? _____ (Col 28)

- (1) _____ Yes, to find rider
- (2) _____ Yes, to physically help rider
- (3) _____ Yes, to help with bags or open door only
- (4) _____ No

9. Number of riders picked up _____ (Col 29)
(Mark 0 if rider does not show up,
8 if a package delivery)

10. Time cab leaves origin: _____ (Col 30-33)
AM
PM
Code four digits
(24 hour clock)

11. Is the the next ride shared with this one? _____ (Col 34)

- (1) _____ Yes
- (2) _____ No

12. Enroute stops requested by this passenger: _____ (Col 35)

- a. Number of stops: _____
- b. Total time spent at stops : _____ (Col 36-37)

13. Time cab arrives at destination: _____ (Col 38-41)
AM
PM
Code four
digits (24
hour clock)

14. Mileage at destination: . (Col 42-45)
Code last four
digits (including
tenths)

15. Does driver get out of cab? _____ (Col 46)

- (1) _____ Yes, to physically help rider
- (2) _____ Yes, to help with bags or open door only
- (3) _____ No

16. Amount of fare: \$. (Col 47-50)

17. Amount of tip: \$.

18. Time cab ready to leave again: _____ (Col 54-57)
AM
PM
Code four
digits (24
hour clock)

CITY OF LAWRENCE TAXI SURVEY

RIDER INFORMATION

Form TAXOB-2

Coding Column
(Code 9 in each
column for
missing value.)

Batch No. _____

(Col 1-2)

Blue Sheet No. _____

(Col 3)

Pink Sheet No. _____

(Col 4-5)

1. Do you live in the City of Kinston?

(1) _____ Yes (2) _____ No

(Col 6)

2a. What is the activity for which you are going on this trip?

- | | |
|---|--|
| (1) _____ Home | (5) _____ Medical |
| (2) _____ Work or School | (6) _____ Visiting friends or relatives |
| (3) _____ Church | (7) _____ Recreational, Cultural, Civic |
| (4) _____ Shopping or Personal Business | (8) _____ Visit social or welfare agency |
| (10) _____ Other _____ | Specify |

(Col 7-8)

2b. What is the activity from which you just came?

- | | |
|--------------------------------|--|
| (1) _____ Home | (5) _____ Medical |
| (2) _____ Work or School | (6) _____ Visiting friends |
| (3) _____ Church | (7) _____ Recreational, Cultural, Civic |
| (4) _____ Shopping or Personal | (8) _____ Visit social or welfare agency |
| (10) _____ Other _____ | Specify |

(Col 9-10)

3a. If you are returning home, how did you get here?

- | | |
|--------------------------|---|
| (1) _____ Auto Passenger | (4) _____ Walk |
| (2) _____ Taxi | (5) _____ Vehicle provided by place you visited |
| (3) _____ Bus | (6) _____ Other |

(Col 11)

3b. If you are coming from home, how do you plan on returning?

- _____ (Col 12)
- | | | | |
|-----------|----------------|-----------|--------------------|
| (1) _____ | Auto Passenger | (4) _____ | Walk |
| (2) _____ | Taxi | (5) _____ | Vehicle provided |
| (3) _____ | Bus | | by place you visit |
| | | (6) _____ | Other |

4. How often do you use taxis?

- _____ (Col 13)
- | | |
|-----------|---|
| (1) _____ | Daily |
| (2) _____ | Several times per week |
| (3) _____ | About once a week |
| (4) _____ | Several times a month (less than once a week) |
| (5) _____ | About once a month |
| (6) _____ | Less than once a month |

5. How would you have made this trip if not by taxi?

- _____ (Col 14)
- | | | | |
|-----------|----------------|-----------|---------------------|
| (1) _____ | Auto Driver | (3) _____ | Walk |
| (2) _____ | Auto Passenger | (4) _____ | Vehicle provided by |
| | | | place you visited |
| | | (5) _____ | Other |

6. How many cab companies (including this one) have you used in the last 4 weeks?

- _____ (Col 15)
- | | |
|-----------|---------------|
| (1) _____ | One |
| (2) _____ | Two |
| (3) _____ | Three or more |

7. How did you get this cab?

- _____ (Col 16)
- | | |
|-----------|--|
| (1) _____ | Called in (Ask 8a) |
| (2) _____ | Made appointment with driver (Ask 8b) |
| (3) _____ | Walked up to cab at stand (Skip to question 9) |
| (4) _____ | Hailed cab (Skip to question 9) |
| (5) _____ | Other (Skip to question 9) |

8a. (If called in): Did you arrange for the cab to pick you up at a particular time?

- _____ (Col 17)
- | | | | |
|-----------|--------------|-----------|-------------|
| (1) _____ | Yes (ask 8b) | (2) _____ | No (ask 8c) |
|-----------|--------------|-----------|-------------|

8b. (If stated time): Were you picked up at the stated time? If not, how long did you wait?

_____ (Col 18)

- (1) _____ Arrived on time
- (2) _____ Less than 5 minutes
- (3) _____ Between 5 and 15 minutes
- (4) _____ Between 15 and 30 minutes
- (5) _____ More than 30 minutes

8c. (If no stated time): How long did it take for the cab to arrive?

_____ (Col 19)

- (1) _____ Less than five minutes
- (2) _____ Between 5 and 15 minutes
- (3) _____ Between 15 and 30 minutes
- (4) _____ More than 30 minutes

9. Do you have any handicap that makes travel difficult?

20 21 22
(Record handicap code)

- (1) _____ Yes
 - (2) _____ No
- Describe _____

10. What is your age? _____ Years old

_____ (Col 23-25)

11. Interviewer record sex of respondent:

_____ (Col 26)

- (1) _____ Male
- (2) _____ Female

12. Interviewer record race of respondent:

_____ (Col 27)

- (1) _____ White
- (2) _____ Black
- (3) _____ Other

13. How many persons live in your household (including yourself)?

_____ (Col 28-29)

_____ Persons

14. How many autos or other motorized vehicles are owned by your household? _____

_____ (Col 30)

15. Do you have a current driver's license?

_____ (Col 31)

- (1) _____ Yes
- (2) _____ No

16. Could you tell me which number on this card best indicates the combined income of all members of your household (before taxes)?

_____ (Col 32)

INCOME RESPONSE CARD

<u>Annual</u>	<u>Monthly</u>
(1) Less than 3,000	Less than \$250
(2) \$3,000 to \$4,999	\$250 to \$415
(3) \$5,000 to \$9,999	\$416 to \$835
(4) \$10,000 to \$15,000	\$836 to \$1,250
(5) Over \$15,000	Over \$1,250
(6) Don't know or refuse	Don't know or refuse

LAWRENCE ON-BOARD TAXI SURVEY
 SURVEY OF DRIVER ATTITUDES
 ON SERVING THE ELDERLY AND HANDICAPPED

To the driver, at the end of the assignment:

As part of this survey we would also like to collect your attitudes on what it is like serving the elderly and handicapped as taxi customers. We would like to know if there is any difference between them and other passengers as far as you are concerned in some of these areas:

1. Is there any difference in the amount of attention they need? In other words, do you usually have to offer any more assistance in getting in or out of the cab, or with packages?

	<u>Elderly</u>	<u>Handicapped</u>
Almost always	_____	_____
Occasionally	_____	_____
Very seldom	_____	_____
No difference	_____	_____
Don't know	_____	_____

2. Do you have any trouble finding out where they want to go, or on how much the fare should be?

	<u>Elderly</u>	<u>Handicapped</u>
Almost always	_____	_____
Occasionally	_____	_____
Very seldom	_____	_____
No difference	_____	_____
Don't know	_____	_____

Lawrence On-Board Taxi Survey -- 2

3. Do you find you have to wait any longer for them to be ready to go when you answer the call compared to other passengers?

	<u>Elderly</u>	<u>Handicapped</u>
Wait longer	_____	_____
No difference	_____	_____
Wait less	_____	_____
Don't know	_____	_____

4. How about the places they travel to or come from? Are they out of the way for you compared to other passengers?

	<u>Elderly</u>	<u>Handicapped</u>
Generally yes	_____	_____
Occasionally	_____	_____
Generally no	_____	_____
About the same	_____	_____
Don't know	_____	_____

5. Do they take longer rides than other persons?

	<u>Elderly</u>	<u>Handicapped</u>
Generally yes	_____	_____
About the same	_____	_____
Generally no	_____	_____
Don't know	_____	_____

6. How do their tips compare with other passengers?

	<u>Elderly</u>	<u>Handicapped</u>
Generally more	_____	_____
About the same	_____	_____
Generally less	_____	_____
Don't know	_____	_____

7. What are your feelings about the taxi discount program for elderly and handicapped? (Use back of sheet for response)

Form TAXOB-5

Batch No. _____

(Col 1-3)

Ride No. _____

(Col 4-5)

LAWRENCE TAXI ON-BOARD SURVEY

- 1a. How often do you make this particular trip?
_____ times per month (Col 6-7)
- 1b. How often did you make this trip before the
user-side subsidy program _____ times per month. (Col 8-9)
- 2a. By what means do you usually travel to this
place now? (Col 10)
- _____ (1) auto driver
_____ (2) auto passenger
_____ (3) bus
_____ (4) taxi
_____ (5) walk
_____ (6) agency service
- 2b. By what means did you usually travel there
before? (Col 11)
- _____ (1) auto driver
_____ (2) auto passenger
_____ (3) bus
_____ (4) taxi
_____ (5) walk
_____ (6) agency service
_____ (7) didn't go before
3. How would you compare this place (quality) you are
going to other places you have gone for
(STATE PURPOSE)? (Col 12)
- _____ (1) have always gone only here for this purpose
_____ (2) better
_____ (3) same
_____ (4) not as good
4. How does this trip compare in distance to places
you have usually gone to for (STATE PURPOSE) in
the past? (Col 13)
- _____ (1) further
_____ (2) same
_____ (3) not as far

- 5a. If you were to come to this place by some other means, would you have come at the same time of day? _____ (Col 14)
- ____ (1) usually yes
____ (2) usually no
- 5b. On the same day of the week? _____ (Col 15)
- ____ (1) usually yes
____ (2) usually no
- 5c. (IF THERE HAS BEEN SOME CHANGE IN THE TIMING OF THE TRIP, ASK): Is this trip easier to schedule now than it was 6 months ago? That is, is this a more convenient time for you to make the trip? _____ (Col 16)
- ____ (1) this is a better time for me
____ (2) about the same
____ (3) not as good

TRANSIT ON-BOARD SURVEY FORM

PUBLIC TRANSIT RIDER SURVEY
CITY OF LAWRENCE DEPARTMENT OF COMMUNITY DEVELOPMENT

Coding Blanks
(Code 9 for missing value)

Date _____

1	2	-	3	4
---	---	---	---	---

(Code Day and Month)

Interviewer Code _____

5

Route _____

6

Direction 1 Inbound 2 Outbound

7

Sex 1 Male 2 Female

8

Race 1 White 2 Black 3 Other

9

Time _____
AM
PM

10	11	:	12	13
----	----	---	----	----

(Code 24 hour clock)

1. First, so that we can determine the number of people who are qualified for the program may I ask your age _____ (years)

14	15	16
----	----	----

2. (RECORD HERE IF PERSON HAS ANY OBVIOUS HANDICAP)

17	18	19
----	----	----

1 Yes DESCRIBE _____

(Code handicap)

2 No

3. IF NO ASK: Do you have any disability that makes travel difficult?

20	21	22
----	----	----

(Code handicap)

1 Yes DESCRIBE _____

2 No

4. Are you a resident of Lawrence?

23

1 Yes 2 No

UNLESS PERSON IS 65 YEARS OR OVER, OR HAS A DISABILITY, THANK RESPONDENT AND TERMINATE INTERVIEW. INTERVIEW ONLY RESIDENTS ON LAWRENCE.

5. Have you transferred from another bus to make this trip?

24

1 Yes 2 No

6. (IF YES, ASK:) Where did you first board a Trombly bus?
(IF NO, ASK:) Where did you get on this bus?

25	26	27
----	----	----

(Code rt. & stop #)

(Street Intersection or Name of Building)

7. Did you walk to the bus stop at the start of your trip?

28

1 Yes 2 No

8. (IF YES, ASK:) How many blocks did you walk? _____ blocks

29	30
----	----

9. Will you have to transfer to another bus to complete your trip?

31

1 Yes 2 No

10. (IF YES, ASK:) Where will you finally get off the Trombly bus?
(IF NO, ASK:) Where will you get off this bus?

32	-	33	34
----	---	----	----

(Code route and stop number)

(Street Intersection or Name of Building)

11. How far will you need to walk from the bus to the place you are going? _____ blocks

35	36
----	----

TRAVEL DIARY SURVEY FORM
(INCLUDING INSTRUCTIONS)

INSTRUCTIONS FOR COMPLETING TRAVEL DIARY

This diary has been designed as a record of ALL TRIPS or JOURNEYS that you happen to make on a day by day basis. You should use it as a logbook to record the details of EACH TRIP which you make on EACH DAY of the four-week reporting period. All TRIPS for which you ventured from your house should be included, whether made by you alone or in the company of others, regardless of how far you traveled, for what purpose you traveled, or by what method you traveled. A SEPARATE LINE should be used for EACH successive TRIP, a SEPARATE SHEET for EACH successive DAY. Extra Sheets are provided at the rear of your logbook should you require them. At the end of EACH seven day period you are to PROMPTLY REMOVE the log record sheets for that week, ENCLOSE them in one of the self-addressed stamped envelopes, and MAIL them back to the SURVEY CENTER in City Hall.

Please use the instructions below as a guide in completing your diary. You will also have assigned to you an aide from the Survey Center who will acquaint you with the rules for completing the diary, and who will always be available by phone to help answer any questions. Your interviewer aide will be calling back on you from time to time to make sure that you are not encountering problems.

Your interviewer's name is Mr./Ms. _____.
He/she can be contacted at: _____.

1. Record ALL TRIPS made for EACH DAY in FULL DETAIL in the logbook. Each log sheet has the day and date printed on it, in the upper right hand corner. If there is not enough room on one sheet for all the trips you take in one day, use one of the spare blank sheets in the back of the notebook (record the correct date on the blank sheet.)
2. A TRIP is defined as a one-way journey for which you leave your house (or place from which you start) to go to some place for ANY PURPOSE by ANY METHOD of TRAVEL. Examples of typical TRIPS are:
 - a) A journey from your Home to the place where you Work.
 - b) A journey from the place where you Work to your Home.
 - c) A journey on foot from your Home to the Home of a Friend to visit.
 - d) A journey from the Home of your Friend in your friend's car to the Grocery Store.
 - e) A journey from the Grocery Store on foot to a Restaurant to have lunch.
 - f) A journey from the Restaurant back to Home in your friend's car.
 - g) A journey to take the dog for a walk after dinner and return Home.

You should include any trip, large or small, for which you must go out of doors. You should also remember that your trips must all "fit together", so that you do not appear to go some place and not come back.

3. For EACH TRIP, record the following information:

- a) WHERE YOU WENT - describe the PLACE you are going and its LOCATION. A good description might be Home, Church, or Home of a Friend. If you have trouble remembering the exact address, the nearest intersection will do. Or perhaps the name of the place will help if you're not sure of the address: "The Old Mill Inn Restaurant on Harvard Street."
- b) TIME YOU LEFT - record the TIME your journey to this place BEGAN as accurately as you remember.
- c) REASON FOR MAKING TRIP - Every trip is made for some PURPOSE, even if it is just for recreation or to accompany or take someone else. Try to describe that reason as COMPLETELY as possible. For example, you could go to the Hospital for several reasons: for a checkup; to engage in some type of charity work; or to visit a friend. Also if you went to a SINGLE PLACE but did SEVERAL THINGS there, try to describe ALL the things. For example, you could have gone to a shopping mall to cash a check, have your eyeglasses fixed, and shop for a gift. A GOOD trip record will show that you did ALL these things.
- d) METHOD OF TRAVEL - this is the PRINCIPAL way by which you traveled on your trip. If you WALKED to the bus stop, and then took the BUS downtown, BUS would be your principal method of travel. If on a particular trip you traveled by more than one METHOD and are not sure which was the PRINCIPAL METHOD of TRAVEL, record EACH method. A trip on which you WALKED is as important as one in which you DRIVE. If you travel some place in an automobile, be sure to indicate if you were the DRIVER or PASSENGER. Always record enough information so that you are sure your record shows what really happened.

An example of a completed travel diary record is attached to these instructions. Also for your convenience, the next page offers you a larger list of typical REASONS for TRAVEL and METHODS of TRAVEL such as you are likely to encounter. Do not hesitate to contact your aide if you are unsure of something; they will be glad to help you.

* * * THANK YOU FOR YOUR HELP * * *

LAWRENCE TRAVEL SURVEY TYPICAL METHODS AND REASONS FOR TRAVEL

Examples of Methods of Travel

Walk
Auto - driver (also pickup, van, motorcycle)
Auto - passenger (also pickup, van, motorcycle)
Taxi
Public Bus (Trombly)
Private vehicle service run by social organization or health facility

Examples of Reasons for Travel

Return Home	Religious Activity
Work	attend church services
School	attend church function
Shopping	Entertainment
groceries	movie, concert, play
convenience store	sports event
clothing, furniture, or other	flower show or exhibit
window shop	play cards, bingo
Automobile Related	Recreation
gas station	visit park
take car to garage	picnic
Personal Business	play sports
visit bank	pleasure walk or drive
hairdresser/barber	walk dog
look for job	Eat Meal
funeral home	restaurant
club meeting	fast food
post office	Provide Service or Company
laundromat	drive someone to or from a place
Medical	accompany someone else on a trip
see doctor or dentist	
visit medical clinic	
Visit Friends or Relative	
at home	
in hospital	

**CITY OF LAWRENCE
DEPARTMENT OF COMMUNITY DEVELOPMENT**

Date _____

TRAVEL DIARY SURVEY

Diary No. _____

Where did you start your first trip today? _____
(Name of place) (Address)

Trip	And then where did you go?	At what time did you leave?	For what reason did you go there?	By what means did you travel?
1	Name of place: Address:	: am : pm		
2	Name of place: Address:	: am : pm		
3	Name of place: Address:	: am : pm		
4	Name of place: Address:	: am : pm		
5	Name of place: Address:	: am : pm		
6	Name of place: Address:	: am : pm		
7	Name of place: Address:	: am : pm		
8	Name of place: Address:	: am : pm		
9	Name of place: Address:	: am : pm		
10	Name of place: Address:	: am : pm		

Always record your trips back home.

FOLLOW-UP SURVEY OF PROJECT REGISTRANTS FORM

CITY OF LAWRENCE
COMMUNITY DEVELOPMENT DEPARTMENT
FOLLOW-UP SURVEY OF TRANSFARE PROJECT REGISTRANTS

Card Number:

1	2
0	1

Project ID:

3	4	5	6

Name:

7	8	9	10	11	12	13	14	15	16	17	18	19	20

 Last

21	22	23	24	25	26	27	28	29	30	31	32	33	34

 First

35

 Init.

Registrant Status:

(USE CALLBACK RULE AS NECESSARY TO DETERMINE)

- 1) Moved away from Lawrence
- 2) Temporarily away from Lawrence (e.g., on vacation)
- 3) Moved to nursing home
- 4) At home, but unable to participate in survey due to medical condition
- 5) Unwilling to participate in survey
- 6) Deceased
- 7) Unable to contact or determine reason for nonparticipation
- 8) Present in Lawrence, and willing and able to participate in survey

→ (SELECT NEXT REGISTRANT)

I'm calling in connection with the TRANSFARE Program. We are currently conducting a survey of people who are registered with TRANSFARE to find out how the service is working. If you have a couple of minutes, I would like to ask you a few questions concerning your use of TRANSFARE. If you are not using TRANSFARE, or if you have been having any trouble using it, I would like to ask you questions about that too.

A. First I would like to find out if there have been any changes in your living arrangements since you registered. (GIVE DATE)

1. Do you still live at (GIVE RESIDENCE ADDRESS)?

- 1) Yes
- 2) No _____
New Address

3) Information _____
Incorrect (Correct Address)

38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	

(Code address if changed)

8) Previously your household owned (GIVE NUMBER) vehicles (automobiles, vans, etc.). Is this still true?

- 1) Yes
- 2) No _____
(New Number)
- 3) Information _____
Incorrect (Correct Number)

73 74 75

(Code number if changed)

B. Now I would like to ask some questions about your travel.

9) When was the last time you rode a taxi in Lawrence?

76

- 1) Within past week
- 2) Within past month
- 3) Within past year
- 4) More than one year
- 5) Never rode (SKIP TO QU. 28)

10) Do you use TRANSFARE tickets to ride taxis?

77

- 1) Yes
- 2) No→(SKIP TO QU. 25)

11) Did you use taxis in Lawrence before TRANSFARE?

78

- 1) Yes
- 2) No→(SKIP TO QU. 13)

Card No.:

Project ID:

12) Do you ride taxis more now than before TRANSFARE:

7

- 1) Yes
- 2) No→(SKIP TO QU. 14)

13) What kinds of taxi trips do you take more of because of TRANSFARE?
(RECORD RESPONSES WITHOUT ITEMIZING CHOICES)

- Work/school 1) Yes 2) No
- Visit friends or relatives 1) Yes 2) No
- Shopping 1) Yes 2) No
- Church/religious 1) Yes 2) No
- Medical 1) Yes 2) No
- Personal business 1) Yes 2) No
- Entertainment/recreation 1) Yes 2) No
- Other 1) Yes 2) No

8

9

0

11

12

13

14

15

CITY OF LAWRENCE
COMMUNITY DEVELOPMENT DEPARTMENT
FOLLOW-UP SURVEY OF TRANSFARE PROJECT REGISTRANTS
INFORMATION REQUIRED FROM REGISTRATION INTERVIEW

Name: _____

Project ID: _____

Registration Date: _____

Residence Address: _____

Number of Individuals in Household: _____

Employment Status: _____

Handicap: _____

Number of Vehicles in Household: _____

Income Range: _____

TELEPHONE SURVEY OF NONREGISTRANTS FORM

CITY OF LAWRENCE
 COMMUNITY DEVELOPMENT DEPARTMENT
 TRANSFARE PROGRAM
 TELEPHONE SURVEY OF NON-REGISTRANTS

Card Number:

1	2
0	1
3	4
5	6
7	
8	9

Household Number: _____
 Number of this Interview in the Household: _____
 Address: _____
 Phone Number: _____
 Interviewer: _____

HELLO, MY NAME IS _____. I'M CALLING
 IN CONNECTION WITH THE TRANSFARE TRANSPORTATION PROGRAM THAT THE
 CITY OF LAWRENCE IS SPONSORING FOR ITS ELDERLY AND HANDICAPPED
 RESIDENTS. IF YOU CAN SPARE A MOMENT, I WONDER IF I COULD ASK
 YOU A FEW QUESTIONS?

- *1. How many people, including yourself, live in your home on a full-time basis? _____
- *2. How many of these people (including yourself if applicable) are 65 years of age or older? _____
- *3. How many of these people (over 65) have some disability that restricts their travel? This means people who need wheel-chairs to get about, people with serious heart conditions, who have epilepsy or some neuromuscular disease, who are mentally retarded, or who are deaf or blind (or seriously hard of hearing or sight impaired.) _____

10	11
12	
13	

*4. Are there any people who are under 65 who have some disability that restricts their travel? [This means people who need wheelchairs or some other means of assistance to get about, people with serious heart conditions, who have epilepsy or some neuromuscular disease, who are mentally retarded, or who are deaf or blind (or seriously hard of hearing or sight impaired).]

- 1) Yes 2) No

14

↓
Describe these individuals by their disability:

- 1) _____
2) _____
3) _____
4) _____

15

(Code number of persons in list:)

IF NO ONE IN HOUSEHOLD IS 65 OR OLDER OR HANDICAPPED, TERMINATE INTERVIEW.

*5. Do you fall in either of these categories, that is, are you 65 or older or disabled?

16

- 1) 65 or older
2) under 65 and disabled
3) no → ASK TO SPEAK WITH ONE OF THE MEMBERS WHO IS HANDICAPPED OR ELDERLY. IF THE DISABILITY PRESENTS A COMMUNICATION PROBLEM, ASK IF SOMEONE CAN SPEAK FOR THE INDIVIDUAL. BEGIN WITH QU 6.

6. What is your age? _____ years.

17 18 19

7. Do you have any disability that makes it difficult for you to travel?

- 1) Yes 2) No → SKIP TO QU 9

20

8. Can you describe your disability?

21 22

9. Have you heard about the TRANSFARE Program?

23

1) Yes

2) No

→ "TRANSFARE is a program operated by the city that offers substantial discounts to elderly or handicapped citizens when riding buses or taxis. I'd be glad to give you more information later if you like." SKIP TO QU 12.

10. Did you participate in the travel diary survey undertaken in connection with the TRANSFARE Program?

1) Yes

→ THANK RESPONDENT AND GO TO INSTRUCTIONS AFTER QU 37.

2) No

24

11. Are you registered with the TRANSFARE Program?

1) Yes

→ THANK RESPONDENT AND GO TO INSTRUCTIONS AFTER QU 37.

2) No

25

12. Do you use any special aids to get about?

26

1) Yes

2) No → SKIP TO QU 13

↓
Wheelchair

1) Yes

2) No

27

Walker

1) Yes

2) No

28

Crutches

1) Yes

2) No

29

Cane (for walking)

1) Yes

2) No

30

Cane (for blind person)

1) Yes

2) No

31

Car with special controls

1) Yes

2) No

32

Seeing-eye dog

1) Yes

2) No

33

Artificial limbs

1) Yes

2) No

34

Braces

1) Yes

2) No

35

Another person

1) Yes

2) No

36

Other

1) Yes

2) No

37

Describe: _____

38

13. Do you have any difficulty performing any of the following activities? (ASK EACH AND CHECK ALL THAT APPLY)

- Walking more than one block 1) ___ Yes 2) ___ No
- Climbing a flight of stairs or escalator 1) ___ Yes 2) ___ No
- Boarding or leaving from a standard bus 1) ___ Yes 2) ___ No
- Standing in a moving bus 1) ___ Yes 2) ___ No
- Sitting down or getting up 1) ___ Yes 2) ___ No
- Reading information signs 1) ___ Yes 2) ___ No
- Hearing announcements 1) ___ Yes 2) ___ No

39

40

41

42

43

44

45

14. Are you able to ride in a taxi?

- 1) ___ Yes 2) ___ No → SKIP TO QU 18

46

15. Do you ever ride taxis in Lawrence?

- 1) ___ Yes 2) ___ No → SKIP TO QU 18

47

16. How often do you ride taxis?

- 1) ___ at least once a week
- 2) ___ at least once a month
- 3) ___ at least once a year
- 4) ___ very infrequently

48

17. On those occasions when you do ride, are there any special conditions that cause you to use a taxi?

49	50
----	----

18. Are you able to use a regular bus?

- 1) ___ Yes
- 2) ___ No → SKIP TO QU 22

51

19. Do you ever ride Trombly buses in Lawrence?

- 1) ___ Yes
- 2) ___ No → SKIP TO QU 22

52

20. How often do you ride Trombly buses?

- 1) ___ at least once a week
- 2) ___ at least once a month
- 3) ___ at least once a year
- 4) ___ very infrequently

53

21. On those occasions when you do ride are there any special conditions that cause you to use a bus?

54	55
<input type="checkbox"/>	<input type="checkbox"/>

22. We are wondering why persons who have not registered for TRANSFARE have not done so. Can you tell me what reasons you may have had for not registering? We would like to hear all of your reasons if there is more than one.

- a.) _____
- b.) _____
- c.) _____
- d.) _____

56	57
<input type="checkbox"/>	<input type="checkbox"/>
58	59
<input type="checkbox"/>	<input type="checkbox"/>
60	61
<input type="checkbox"/>	<input type="checkbox"/>
62	63
<input type="checkbox"/>	<input type="checkbox"/>

23. (ASK ONLY IF MORE THAN ONE REASON IN QU 22)

Which is the most important reason?

64	65
<input type="checkbox"/>	<input type="checkbox"/>

Card Number:

Household Number:

Number of this
Interview in
Household:

		1	2
		0	2
3	4	5	6
			7

*24. Does your household own any cars or trucks (in operating condition)?

1) Yes 2) No → SKIP TO QU 26

8

*25. How many? _____

9	10
---	----

26. Do you have a valid driver's license?

1) Yes 2) No

11

*27. How many drivers are there in your household (including yourself)? _____

12	13
----	----

28. When did you last drive?

- 1) Within past month
- 2) Within past 3 months
- 3) Within past year
- 4) More than 1 year
- 5) Never drove

14

29. How far do you live from the nearest bus stop? (TRY TO OBTAIN ANSWER IN BLOCKS; 1 MILE = 8 BLOCKS)

_____ blocks

15	16	17
----	----	----

30. How long does it take to walk there? _____ Minutes

18	19
----	----

31. Can you tell me which method of travel you use most often: is it walking, driving, riding as a passenger in a car, taxi, bus, social service agency vehicle, or some other means?

20

- 1) ___ walk
- 2) ___ auto driver
- 3) ___ auto passenger
- 4) ___ taxi
- 5) ___ Trombly bus
- 6) ___ social service agency vehicle
- 7) ___ Other (SPECIFY) _____

21

32. What method of travel do you use most frequently after (STATE MODE FROM QU 31)?

22

- 1) ___ walk
- 2) ___ auto driver
- 3) ___ auto passenger
- 4) ___ taxi
- 5) ___ Trombly bus
- 6) ___ social service agency vehicle
- 7) ___ other (SPECIFY) _____

23

33. What is your marital status?

24

- 1) ___ Single 2) ___ Married
- 3) ___ Formerly married (widowed, divorced, or separated)

25

34. What is your employment status?

- 1) Employed full-time
- 2) Employed part-time
- 3) Unemployed
- 4) Retired
- 5) Student
- 6) Homemaker
- 7) Other (SPECIFY) _____

26

*35. I'm going to read you a list of categories, and I'd like you to stop me when I reach the one that best represents the combined income (before taxes) of your household last year. Is it:

27 28

- 1) less than \$3,000 (less than \$250 per month)
- 2) \$3,000 to \$4,999 (\$250 to \$417 per month)
- 3) \$5,000 to \$7,999 (\$417 to \$667 per month)
- 4) \$8,000 to \$11,999 (\$667 to \$1,000 per month)
- 5) \$12,000 to \$14,999 (\$1,000 to \$1,250 per month)
- 6) \$15,000 to \$20,000 (\$1,250 to \$1,666 per month)
- 7) Over \$20,000 (over \$1,666 per month)
- 8) Refused
- 9) Don't know

} INTERVIEWER: DO NOT READ
AS POSSIBLE OPTION

36. Just to be sure we are representing all groups in our survey, please tell me if you describe yourself as (READ LIST)...

- 1) ____ White/Caucasian
- 2) ____ Black/Afro-American
- 3) ____ Hispanic/Latin American
- 4) ____ Other

29

37. INTERVIEWER RECORD SEX OF RESPONDENT

- 1) ____ Male
- 2) ____ Female

30

THAT COMPLETES MY LIST OF QUESTIONS. THANK YOU VERY MUCH FOR YOUR COOPERATION.

IF THERE IS MORE THAN ONE ELIGIBLE PERSON IN THE HOUSEHOLD, INTERVIEW AS MANY OTHERS AS YOU CAN. FOR NEW INTERVIEWS IN SAME HOUSEHOLD, USE NEW FORM, BUT DO NOT ADMINISTER QUESTIONS WITH ASTERISKS (*). FILL IN QUESTIONS WITH ASTERISKS USING INFORMATION FROM PREVIOUS INTERVIEW.

APPENDIX B. SOCIAL SERVICE AGENCY DESCRIPTIONS

TABLE B-1. DESCRIPTION OF SAMPLE SOCIAL SERVICE AGENCIES

<u>Agency</u>	<u>Year Founded</u>	<u>Public or Private</u>	<u>Affiliations</u>	<u>Mission</u>	<u>Official Client Definition</u>	<u>Official Service Area</u>
Department of Public Welfare	1968	Public	Welfare Department, Commonwealth of Massachusetts	"To provide a wide variety of social services for the poor and needy"	Any individual or family eligible under federal poverty standards or, for certain programs, and "needy" individuals	Lawrence & Andover for Assistance Payments; Lawrence, Methuen, Andover, North Andover for Services
Elder Services of the Merrimack Valley, Inc.	1974	Private	Lawrence General Hospital, Greater Lawrence Community Action Council, Kelly Home Girl, Greater Lawrence Mental Health Center, Greater Lawrence Consortium on Health Services	"To prevent inappropriate institutionalization"	Any individual 60 years of age and older	Twenty-three cities and towns in the Merrimack Valley
Greater Lawrence Chapter of the National Red Cross	1933 (Lawrence Chapter); 1905 (Essex County Chapter)	Public	American Red Cross, Merrimack Valley United Fund	"To improve the quality of human life and enhance individual self-reliance and concern for others"	Any individual in need of one of the services provided by the Red Cross	Lawrence, Methuen, Andover, North Andover, and Salem (New Hampshire)
Greater Lawrence Community Action Council	1963	Private	Elder Services of the Merrimack Valley, American Cancer Society, Merrimack Area Councils on Aging, Department of Public Welfare, F.I.S.H., Massachusetts Rehabilitation Commission, Lawrence Housing Authority, Title VII Nutrition Project	"To serve the poor, the old, and the handicapped citizens of Greater Lawrence"	Agency: Any person meeting federal poverty standards, over 60 years of age, or handicapped; Transportation Program: Any person over 60 or handicapped	Lawrence, Andover, North Andover, and Methuen
Lawrence Council for Aging	1966	Public	City of Lawrence; Greater Lawrence Community Action Council, Greater Lawrence Mental Health Center, Greater Lawrence Regional Association of Councils on Aging; Merrimack Valley Health	"To identify and solve problems associated with Senior Citizens" (from City of Lawrence ordinance)	Any individual 60 years of age or over	City of Lawrence

TABLE B-1. DESCRIPTION OF SAMPLE SOCIAL SERVICE AGENCIES (CONT)

<u>Agency</u>	<u>Year Founded</u>	<u>Public or Private</u>	<u>Affiliations</u>	<u>Mission</u>	<u>Official Client Definition</u>	<u>Official Service Area</u>
Lawrence Council for Aging (Continued)			Planning Council; and Lawrence Housing Authority			
Lawrence General Hospital Rehabilitation Center	1969	Private	Lawrence General Hospital	"To help handicapped individuals function as independently as possible"	Any handicapped individual, including the mentally handicapped, as long as they do not "act out physically"; clients are referred to Lawrence General Hospital Rehabilitation by third parties	Northeastern Massachusetts and Southern New Hampshire

TABLE B-1. DESCRIPTION OF SAMPLE SOCIAL SERVICE AGENCIES (CONT)

Agency	Services Provided	Number of Current Users and Frequency of Use	Number of Elderly (Nonhandicapped/Handicapped)	Number of Nonelderly (Nonhandicapped/Handicapped)
Department of Public Welfare	Assistance Payments (e.g., Supplemental Security Income); Title XX Services (e.g., homemaker care, babysitting, consulting)	Assistance Payments: 8754 (duplicated total); Title XX Services: 620 (duplicated total) for May 1978 (frequency of 1978 use varies by service)	Data not broken out; would require several person-days of effort	Data not broken out; would require several person-days of effort
Elder Services of the Merrimack Valley, Inc.	Only direct service: Case Management; Indirect Services: (through contract to other agencies) homemaker chore services, transportation	Not available from agency (most services are indirectly provided)	Not available from agency (most services are indirectly provided)	Not available from agency (Most services are indirectly provided)
Greater Lawrence Chapter of the National Red Cross	Service to Military Families and Veterans, Blood Donorship, First Aid and Safety Courses, Disaster Relief, Meals on Wheels; Transportation	Approximately 10,000 total unduplicated per year; varies by program (e.g., disaster victims, 700/year; service to military families and veterans, 900/year)	Data not available, but estimated to be less than proportionate to population	Data not available, but estimated to be less than proportionate to population
Greater Lawrence Community Action Council	Elderly Transportation Program, Elderly Food Coop, Intake/Referral, Consumer Affairs, Home Chore Program, Energy Conservation, Rehabilitation, Legal Services, Hispanic Health and Illness Prevention Program, and numerous other social services	Not readily available; kept separately by office (e.g., Consumer Affairs) and quality of records (apparently) is spotty; availability requires formal approval of agency's Executive Director after written and personal request	Not readily available; kept separately by office (e.g., Consumer Affairs) and quality of records (apparently) is spotty; availability requires formal approval of agency's Executive Director, after written and personal request	Not readily available; kept separately by office and quality of records (apparently) spotty; availability requires formal approval of agency's Executive Director, after written and personal request

TABLE B-1. DESCRIPTION OF SAMPLE SOCIAL SERVICE AGENCIES (CONT.)

Agency	Services Provided	Number of Current Users and Frequency of Use	Number of Elderly (Nonhandicapped/Handicapped)	Number of Nonelderly (Nonhandicapped/Handicapped)
Lawrence Council for Aging	Elderly Health Program, Transportation, Title VII Nutrition Program, High School Hot Lunch Program, Education, Social Activities, Project OASIS	92,000 "service units" to approximately 500 persons in 1977; varies by program (e.g., Title VIII Nutrition Program, 35,000; High School Hot Lunch Program, 17,000; Social Activities, 130)	500 (450, 50)	0 (0, 0)
Lawrence General Hospital Rehabilitation Center	Speech and Hearing Therapy, Alcohol Detoxification; Vocational Services (Evaluation Counseling and Occupational Therapy); Transportation	120 users daily	12 (1, 11)	108 (13, 95)

TABLE B-2. DESCRIPTION OF AGENCY TRANSPORTATION SERVICES, 1978

<u>Agency</u>	<u>Transportation Program?</u>	<u># of Vehicles & Characteristics</u>	<u># of Drivers & Characteristics</u>	<u>Other Special Transportation Staff</u>	<u>Type of Service</u>	<u>Scheduling</u>	<u>Transportation Service Area</u>	<u>Eligibility Requirement</u>
Department of Public Welfare	Yes	None	None	None	Reimbursement for exclusive ride taxi service	Same as for exclusive ride taxi service	Anywhere in Massachusetts	Anyone on public assistance
Elder Services of the Merrimack Valley, Inc.	Yes	None operated by agency; contract with Community Action to run 2 vans (details below)	REFER TO GREATER LAWRENCE COMMUNITY ACTION COUNCIL ENTRY					
Greater Lawrence Chapter of the National Red Cross	Yes	2 9-passenger, radio-equipped, station wagons; no special adaptive devices; one vehicle, dated 1975; the other, 1972	25 volunteer drivers work once every 2 weeks; most drivers have first aid training	No; radio used only for emergencies	Demand-responsive door-to-door	One week advance notice usually required, although return trips are usually provided on a demand basis	Triangle formed by Lowell, Bedford and Manchester (New Hampshire)	Veterans, servicemen, and their families are eligible
Greater Lawrence Community Action Council	Yes	Operate 1 12-passenger & 1 15-passenger van (with hydraulic lift) Contract with Lawrence Council on Aging to operate 3 station wagons (see below for details on this program)	6-part time drivers with National Safety Program and CPR training	2 part-time dispatchers	Demand-responsive door-to-door	24-hour advance notice required; scheduling demand "a major problem; cancellations frequent and no radio system to communicate with drivers	Lawrence, Methuen, Andover, North Andover	Any person 60 years of age or older

TABLE B-2. DESCRIPTION OF AGENCY TRANSPORTATION SERVICES, 1978 (CONT.)

Agency	Transportation Program?	# of Vehicles & Characteristics	# of Drivers & Characteristics	Other Special Transportation Staff	Type of Service	Scheduling	Transportation Service Area	Eligibility Requirement
Lawrence Council on Aging	Yes	3 station wagons	3 full-time drivers; no special training	1 full-time transportation coordinator	Demand-responsive, door-to-door	24-hour advance notice required; frequently cannot take client on return trip	Lawrence, Methuen, Andover, North Andover	60 years of age & older
Lawrence General Hospital Rehabilitation Center	Yes	3 60-passenger buses; 2 9-passenger vans (one with hydraulic lift); and 3 6-passenger station wagons	4 full-time drivers with special training in assisting handicapped individuals	1 full-time transportation coordinator	Buses: fixed route, many-to-one service; Vans: 2 In AM; demand-responsive door-to-door (operated infrequently)	regular schedule, 2-hour runs In AM, Wakefield, North Andover, Salsbury, Lynn, Beverly, and Middleton	Lawrence, Lowell, Billerica, Burlington, Woburn, Wakefield, Reading, North Andover, Andover, Newburyport, Salsbury, Lynn, Beverly, and Middleton	Any client of Lawrence General Hospital, Rehabilitation Center

TABLE B-2. DESCRIPTION OF AGENCY TRANSPORTATION SERVICES, 1978 (CONT)

Agency	Characteristics of People Served	Hours of Service	Peak Hours	Seasonal Fluctuations	Trip Restrictions (e.g. Purpose)	Trip Purposes Served	User Charges	Volunteer Provided Transportation	Contact with Taxi Operators	Charter Buses
Department of Public Welfare	Below poverty level by federal standards	Same as for exclusive ride taxi service	Same as for exclusive ride taxi service	Same as for exclusive ride taxi service	Medical trip purpose and doctor's written statement that taxi transportation necessary	Medical 100%	None	None	Yes, as described in previous table entries	None
Elder Services of the Merrimack Valley, Inc.										
REFER TO GREATER LAWRENCE COMMUNITY ACTION COUNCIL ENTRY										
Greater Lawrence Chapter of the National Red Cross	Generally \$4000 to \$7000 (most receiving pensions) income; 80% handicapped; 35-40% elderly	9AM-5PM, 5 days (except for emergencies)	10 to 11 AM and 1 to 2 PM (peak hour for medical appt's.)	None cited	Medical & Special projects (e.g., workshops for the blind)	Medical 71% Other 29% (i.e., special projects)	None	None (Insurance problem cited)	None	None
Greater Lawrence Community Action Council	Generally low-income	8AM-6PM Mon. - Fri., 10AM-4PM on Sat.	11AM to 2PM	None cited	Priority hierarchy: medical (1st), shopping (2nd), social (3rd)	Medical 43% Shopping 16% Other 41% (e.g., social)	None	None	None	None
Lawrence Council on Aging	"No Idea"	8AM-4PM, 5 days/week	10AM to 11:30AM (hours of winter peak shopping travel demand)	Ridership decline in winter	None	Shopping 60% Medical 29% Other 11% (e.g., social)	None	None	None	None

TABLE B-2. DESCRIPTION OF AGENCY TRANSPORTATION SERVICES, 1978 (CONT)

<u>Agency</u>	<u>Characteristics of People Served</u>	<u>Hours of Service</u>	<u>Peak Hours</u>	<u>Seasonal Fluctuations</u>	<u>Trip Restrictions (e.g. Purpose)</u>	<u>Trip Purposes Served</u>	<u>User Charges</u>	<u>Volunteer Provided Transportation</u>	<u>Contact with Taxi Operators</u>	<u>Charter Buses</u>
Lawrence General Hospital Rehabilitation Center	Handicapped; most low income, but some wealthy individuals	6:30AM to 8:30AM, & 4:30PM to 6:30PM for fixed route service; 6:30 AM to 6:30 AM for demand responsive, 5 days/week	None cited	None cited	Trips to Center; emergency medical	Nearly 100% are trips to Center	Range from \$2/week with-in Lawrence to \$12/week from Lowell or Newburyport; average user charge is \$5.00	None	None	None

TABLE B-2. DESCRIPTION OF AGENCY TRANSPORTATION SERVICES, 1978 (CONT)

Agency	Average # of Passengers Per Week (One-Week, Unduplicated)	Average Trip Length	Transportation Related Costs	Transportation Costs (Actual) as a Percent of Total Agency Budget	(Actual) Costs Per Person Trip (One-Week)	Problems With Transportation Service	Funding
Department of Public Welfare	11 per week	20 miles (many trips to Boston hospitals) a recent "crackdown" by state may lead to more local trips	\$14,300*/year; recent crackdown may result in lower costs in future	-.0048%	Perceived & Actual: \$25.00* Recent "crackdown" may result in lower average costs per trip in future	Cost: state regulation mandate agency to pay taxi fares to any part of state if client meets trip purpose requirements in lower average stipulated in regulations	Commonwealth of Massachusetts
Elder Services of the Merrimack Valley, Inc.	REFER TO GREATER LAWRENCE COMMUNITY ACTION COUNCIL ENTRY	Actual & Perceived: \$40,000	.02%	REFER TO GREATER LAWRENCE COMMUNITY ACTION COUNCIL ENTRY			
Greater Lawrence Chapter of the National Red Cross	6 per week	5-10 miles	Actual: \$6983/year Perceived: \$4002/year	39.9%	Perceived: \$12.83 Actual: \$22.39	Rescheduling doctor's appointments to provide "efficient" service often a problem; high cost of providing transportation recognized	United Way, private donations
Greater Lawrence Community Action Council	183/week (May 1978): 90/week (Average for 1978)	3 miles	Perceived: 16,451/year Actual: 43,568/year	Not available	Perceived: \$3.55 Actual: \$9.41	Cancellations cited as a major problem, especially since they have no radio to communicate with drivers	HEW Title III of the Older American Act) thru Elder Services of the Merrimack Valley, Inc.

*Estimated

TABLE B-2. DESCRIPTION OF AGENCY TRANSPORTATION SERVICES, 1978 (CONT)

Agency	Average # of Passengers Per Week (One-May, Unduplicated)	Average Trip Length	Transportation Related Costs	Transportation Costs (Actual) as a Percent of Total Agency Budget	(Actual) Costs Per Person Trip (One-Way)	Problems With Providing Own Transportation Service	Funding
Lawrence Council on Aging	125 per week	.5 miles; encourage persons to use nearby facilities	Perceived: 0 (Community Action & HEW pay transportation) Actual: Not Available	Not available (total agency budget: \$22,600)	Not available	Scheduling problems frequently prevent them from providing clients with return trips	Greater Lawrence Community Action; Comprehensive Employment and Training Act
Lawrence General Hospital Rehabilitation Center	305 per week	7 miles	Actual: 30,000* per year	12.1%	Actual: \$1.90*	No problems cited	90% from State agencies (Massachusetts Rehabilitation Commission, MA Dept. of Mental Health); 10% from private sector sources (e.g., insurance companies)

*Estimated

APPENDIX C. ELIGIBILITY CRITERIA

APPENDIX C. ELIGIBILITY CRITERIA

EACH PROJECT PARTICIPANT MUST:

1) Reside in the City of Lawrence,

AND BE EITHER

- 2) 65 years of age or older, establishing their age through use of:
- a) City Directory (listing of all residents of Lawrence and their dates of birth);
 - b) Driver's license; or
 - c) Any other identification showing birthdate, such as a birth certificate, insurance card, etc.

OR

3) Handicapped, due to:

- a) Nonambulatory disabilities -- impairments that, regardless of cause of manifestation, for all practical purposes confine individuals to wheelchairs.
- b) Semi-ambulatory disabilities -- impairments that cause individuals to walk with difficulty or insecurity. Individuals who are amputees, use braces or crutches, or have arthritis, neuromuscular disorders, or pulmonary or cardiac conditions may be considered semi-ambulatory.
- c) Sight disabilities -- total blindness or uncorrectable impairment affecting sight to the extent that the individual is insecure or exposed to danger when in public.
- d) Hearing disabilities -- total deafness or uncorrectable hearing handicaps that make an individual insecure in public areas because of an inability to communicate or hear warning signals.
- e) Disabilities of incoordination -- faulty coordination or palsy from brain, spinal, or peripheral nerve injury.
- f) Mental retardation -- applicant must have an IQ of 49 or less and be unable to perform routine repetitive tasks or have physical or other mental impairment resulting in restriction of function.
- g) Brain damage -- diagnosis by a psychiatrist, neurologist, or clinical pathologist, establishing that the applicant has organic brain syndrome.

In cases where handicaps are not obvious, a physician's statement or other documentation was required as proof of eligibility.

APPENDIX D. CHARACTERISTICS OF PROJECT USERS

TABLE D-1. COMPARISON OF PROJECT TAXI USERS AND
PROJECT BUS USERS
(Percent)

	<u>Use Taxi, Not Bus</u>	<u>Use Bus, Not Taxi</u>	<u>Use Both</u>	<u>Use Neither</u>
Age				
5-54	7.5	7.1	6.0	6.2
55-64	7.5	5.4	8.2	4.5
65-69	24.4	35.7	29.6	30.5
70-74	21.8	23.2	25.4	27.4
75-84	34.8	24.8	27.5	27.0
85+	4.0	3.9	3.3	4.3
Sex				
Male	23.2	32.6	19.4	34.6
Female	76.8	67.4	80.6	65.4
Race				
White	99.1	99.8	99.4	99.3
Black	0.8	0.1	0.4	0.0
Other	0.1	0.1	0.2	0.7
Marital Status				
Married	18.3	19.5	20.5	15.1
Single	31.5	40.9	28.4	44.0
Formerly married	50.2	39.6	51.1	40.9
Handicap Status				
No handicap	48.9	68.0	58.2	66.7
Non-ambulatory	0.4	0.0	0.1	0.0
Semi-ambulatory	14.3	4.3	7.3	7.1
Cardiovascular	20.2	14.7	15.9	14.2
Respiratory	2.5	1.7	1.9	1.2
Nervous system	2.8	1.1	3.0	1.4
Sight	6.4	2.8	5.6	4.8
Hearing	2.1	2.1	4.6	3.0
Mental disorder	2.4	5.4	3.4	1.6

Table continued on following page.

TABLE D-1. COMPARISON OF PROJECT TAXI USERS AND
PROJECT BUS USERS (CONT.)
(Percent)

	<u>Use Taxi, Not Bus</u>	<u>Use Bus, Not Taxi</u>	<u>Use Both</u>	<u>Use Neither</u>
Aids (Multiple Responses)				
Braces	1.0	0.1	0.4	0.2
Artificial limbs	0.3	0.1	0.5	0.2
Crutches	1.4	0.3	0.7	0.7
Wheelchair	0.6	0.0	0.2	0.5
Walker	1.3	0.1	0.5	1.1
Cane (for walking)	15.0	4.2	7.3	6.3
Cane (for blind person)	0.4	0.1	0.7	0.9
Escort	1.9	0.6	1.3	2.3
Other	0.5	0.9	2.0	1.6
Current Driver's License				
Yes	23.3	28.5	17.6	45.6
No	76.7	71.5	82.4	54.5
Number of Vehicles in Household				
0	70.9	60.7	77.5	43.9
1	26.9	35.6	20.9	52.0
2	2.0	3.1	1.5	3.2
3+	0.3	0.5	0.1	0.9
Household Size				
1	52.9	43.6	54.4	41.9
2	38.9	44.4	38.1	47.0
3	5.2	6.6	5.5	5.8
4+	3.1	5.4	2.1	5.3
Number in Household 65 Years or Over				
0	13.9	12.4	11.5	9.7
1	57.9	49.9	59.0	48.5
2	27.0	36.8	27.9	39.9
3	1.3	0.9	1.6	1.9

Table continued on following page.

TABLE D-1. COMPARISON OF PROJECT TAXI USERS AND
PROJECT BUS USERS (CONT.)
(Percent)

	<u>Use Taxi, Not Bus</u>	<u>Use Bus, Not Taxi</u>	<u>Use Both</u>	<u>Use Neither</u>
Number in Household				
Less than 65 Years				
and Handicapped				
0	82.3	86.6	85.6	88.0
1	14.8	10.7	12.5	10.6
2+	2.9	2.8	1.9	1.4
Employment Status				
(Multiple Responses)				
Employed full-time	2.3	1.8	2.5	2.8
Employed part-time	3.1	3.0	2.8	2.8
Unemployed	21.7	16.7	17.6	19.8
Retired	84.6	87.0	85.9	88.2
Student	0.9	1.0	0.6	0.9
Homemaker	19.3	23.6	26.3	18.2
Other	2.3	0.6	1.6	1.0
Household income:				
Less than \$3,000	34.1	31.9	37.0	26.2
\$ 3,000 to \$4,999	44.6	44.0	45.9	39.2
\$ 5,000 to \$7,999	16.4	17.2	12.7	25.0
\$ 8,000 to \$11,999	3.0	5.1	2.5	6.6
\$12,000 to \$14,999	1.6	1.0	1.1	2.2
\$15,000 to \$20,000	0.4	0.6	0.6	0.8
Over \$20,000	0.0	0.1	0.2	0.0
	(n=802)	(n=800)	(n=1230)	(n=578)

SOURCE: Registration interviews, July 1978 to February 1980, and project taxi and bus ticket use records.

TABLE D-2. COMPARISON OF FREQUENT AND INFREQUENT
PROJECT TAXI USERS
(Percent)

	Average Number of Project Taxi Trips Per Month			
	<u>0</u>	<u>0.1-0.9</u>	<u>1.0-6.9</u>	<u>7.0+</u>
Age				
5-54	6.8	3.0	6.2	14.8
55-64	5.0	5.8	8.2	10.8
65-69	33.5	28.6	26.5	29.2
70-74	24.9	27.2	23.9	18.8
75-84	25.7	31.7	31.3	24.3
85+	4.1	3.6	3.9	2.2
Sex				
Male	33.5	24.6	18.4	22.5
Female	66.5	75.4	81.6	77.5
Race				
White	99.6	99.7	99.1	99.1
Black	0.1	0.3	0.6	0.6
Other	0.4	0.0	0.3	0.3
Marital Status				
Married	17.6	17.7	18.8	25.9
Single	42.2	37.3	27.2	24.0
Formerly married	40.2	44.9	54.1	50.1
Handicap Status				
No handicap	67.5	62.5	53.6	42.9
Non-ambulatory	0.0	0.2	0.3	0.0
Semi-ambulatory	5.5	7.6	11.2	11.3
Cardiovascular	14.5	14.8	17.7	22.3
Respiratory	1.5	2.1	1.7	4.0
Nervous system	1.2	2.1	3.0	4.4
Sight	3.7	4.1	6.7	6.6
Hearing	2.5	5.2	3.2	1.8
Mental disorder	3.7	1.4	2.7	6.6

Table continued on following page.

TABLE D-2. COMPARISON OF FREQUENT AND INFREQUENT
PROJECT TAXI USERS (CONT.)
(Percent)

	Average Number of Project Taxi Trips Per Month			
	<u>0</u>	<u>0.1-0.9</u>	<u>1.0-6.9</u>	<u>7.0+</u>
Aids (Multiple Responses)				
Braces	0.2	0.5	0.6	0.9
Artificial limbs	0.2	0.2	0.6	0.0
Crutches	0.4	0.2	1.1	2.2
Wheelchair	0.2	0.3	0.5	0.0
Walker	0.5	0.3	1.0	0.9
Cane (for walking)	5.1	8.5	10.4	13.3
Cane (for blind person)	0.4	0.0	0.8	0.6
Escort	1.3	1.2	1.4	2.8
Other	1.2	1.3	1.5	1.5
Current Driver's License				
Yes	35.7	27.9	17.2	14.9
No	64.3	72.1	82.8	85.1
Number of Vehicles in Household				
0	53.7	61.3	78.9	86.3
1	42.5	36.7	19.1	12.8
2	3.2	1.7	1.9	0.9
3+	0.7	0.3	0.1	0.0
Household Size				
1	42.9	47.0	55.9	58.6
2	45.5	45.2	36.5	33.0
3	6.2	4.9	5.3	6.2
4+	5.3	2.9	5.3	2.2
Number in Household 65 Years or Over				
0	11.3	7.4	12.1	22.7
1	49.3	55.8	60.8	56.4
2	38.1	35.3	25.6	19.6
3	1.3	1.5	1.5	1.3

Table continued on following page.

TABLE D-2. COMPARISON OF FREQUENT AND INFREQUENT
PROJECT TAXI USERS (CONT.)
(Percent)

	Average Number of Project Taxi Trips Per Month			
	<u>0</u>	<u>0.1-0.9</u>	<u>1.0-6.9</u>	<u>7.0+</u>
Number in Household Less than 65 Years and Handicapped				
0	87.2	90.8	83.6	74.8
1	10.6	8.1	13.5	22.7
2+	2.2	1.2	2.9	2.5
Employment Status (Multiple Responses)				
Employed full-time	2.2	2.0	2.3	4.0
Employed part-time	2.9	3.2	2.3	4.6
Unemployed	18.0	17.9	18.3	24.2
Retired	87.5	90.2	85.8	74.9
Student	1.0	0.5	0.7	0.9
Homemaker	21.3	21.3	25.3	21.7
Other	0.8	1.0	1.9	3.1
Household income:				
Less than \$3,000	29.5	32.8	37.5	35.9
\$ 3,000 to \$4,999	42.0	43.2	46.2	46.3
\$ 5,000 to \$7,999	20.5	19.2	11.6	13.6
\$ 8,000 to \$11,999	5.7	3.3	2.2	3.1
\$12,000 to \$14,999	1.5	1.5	1.4	0.7
\$15,000 to \$20,000	0.7	0.0	1.0	0.4
Over \$20,000	0.1	0.0	0.2	0.0
	(n=1378)	(n=605)	(n=1106)	(n=326)

SOURCE: Registration interviews, July 1978 to February 1980, and project taxi ticket use records.

TABLE D-3. COMPARISON OF FREQUENT AND INFREQUENT
PROJECT BUS USERS
(Percent)

	Average Number of Project Bus Trips Per Month			
	0	0-4.9	5-15.9	16.0+
Age				
5-54	7.0	6.4	6.4	6.7
55-64	6.3	7.0	6.2	9.1
65-69	27.0	30.9	32.0	36.8
70-74	24.1	23.5	26.5	23.9
75-84	31.5	27.9	26.1	21.4
85+	4.1	4.3	2.9	2.1
Sex				
Male	28.0	23.7	24.0	29.6
Female	72.0	76.3	76.0	70.4
Race				
White	99.2	99.5	99.7	99.3
Black	0.4	0.3	0.3	0.4
Other	0.4	0.3	0.0	0.3
Marital Status				
Married	17.0	18.6	20.3	25.8
Single	36.7	35.0	33.0	26.1
Formerly married	46.3	46.4	46.7	48.1
Handicap Status				
No handicap	56.3	60.5	65.3	61.0
Non-ambulatory	0.3	0.1	0.0	0.0
Semi-ambulatory	11.3	6.8	4.5	6.6
Cardiovascular	17.7	15.9	14.5	15.8
Respiratory	2.0	2.0	1.2	2.6
Nervous System	2.2	1.9	2.7	3.1
Sight	5.7	5.6	3.1	3.5
Hearing	2.5	3.6	4.1	2.2
Mental Disorder	2.0	3.6	4.5	5.3

Table continued on following page.

TABLE D-3. COMPARISON OF FREQUENT AND INFREQUENT
PROJECT BUS USERS (CONT.)
(Percent)

	Average Number of Project Bus Trips Per Month			
	0	0-4.9	5-15.9	16.0+
Aids (Multiple Responses)				
Braces	0.7	0.4	0.3	0.0
Artificial limbs	0.2	0.2	0.7	0.4
Crutches	1.1	0.6	0.7	0.0
Wheelchair	0.6	0.1	0.2	0.0
Walker	1.2	0.4	0.3	0.0
Cane (for walking)	11.4	7.1	4.6	4.9
Cane (for blind person)	0.6	0.4	0.5	0.7
Escort	2.1	1.1	1.2	0.4
Other	1.0	1.3	2.4	0.4
Current Driver's License				
Yes	32.7	24.5	20.1	15.0
No	67.3	75.5	79.9	85.0
Number of Vehicles in Household				
0	59.6	65.9	75.2	82.2
1	37.4	31.2	22.9	16.7
2	2.5	2.6	1.7	1.1
3+	2.3	0.3	0.2	0.0
Household Size				
1	48.3	48.2	50.9	56.6
2	42.3	41.9	41.0	34.3
3	5.5	6.2	5.3	5.9
4+	4.0	3.7	3.0	3.1
Number in Household 65 Years or Over				
0	12.1	11.7	11.0	14.3
1	54.0	53.7	56.4	61.0
2	32.4	33.5	31.6	22.3
3+	1.5	1.1	1.0	2.4

Table continued on following page.

TABLE D-3. COMPARISON OF FREQUENT AND INFREQUENT
PROJECT BUS USERS (CONT.)
(Percent)

	Average Number of Project Bus Trips Per Month			
	<u>0</u>	<u>0-4.9</u>	<u>5-15.9</u>	<u>16.0+</u>
Number in Household Less than 65 Years and Handicapped				
0	84.7	86.2	86.0	85.0
1	13.0	11.5	11.6	13.2
2+	2.3	2.4	2.4	1.7
Employment Status (Multiple Responses)				
Employed full-time	2.5	2.0	1.5	4.5
Employed part-time	3.0	1.8	3.2	6.3
Unemployed	20.9	19.3	13.5	16.0
Retired	86.1	86.6	87.9	82.2
Student	0.9	1.0	0.5	0.4
Homemaker	18.8	24.3	26.8	25.1
Other	1.8	1.3	1.4	0.4
Household income:				
Less than \$3,000	30.8	32.5	39.2	36.1
\$ 3,000 to \$4,999	42.3	47.3	41.5	45.5
\$ 5,000 to \$7,999	20.0	14.6	14.6	13.3
\$ 8,000 to \$11,999	4.5	3.2	4.0	3.5
\$12,000 to \$14,999	1.8	1.5	0.4	0.8
\$15,000 to \$20,000	0.6	0.9	0.2	0.4
Over \$20,000	0.0	0.1	0.2	0.4
	(n=1380)	(n=1154)	(n=597)	(n=287)

SOURCE: Registration interviews, July 1978 to February 1980, and project bus ticket use records.

APPENDIX E. REPORT OF INVENTIONS

REPORT OF INVENTIONS

The work performed under this contract, while leading to no new invention, has provided information and insights concerning the practical application of user-side subsidies in public transportation. This information will facilitate future applications of user-side subsidies, and should contribute to an improvement in the overall cost-effectiveness of future public transportation expenditures by illustrating in part the merits and impacts of this innovative service concept.