quately. Successful new entry into the industry may no longer be possible for individual entrepreneurs hoping to make a go of ERT operations but only for management firms that have a strategy for capturing contracts. Small firms may find it most advantageous to join forces with such management firms, to sell out to them, or to join forces to create such firms themselves. Although larger and fewer taxi companies may result, they should be financially stronger and managerially and operationally more competent, and their greater assets should enable them to acquire the capabilities needed to become full-fledged paratransit providers.

ACKNOWLEDGMENT

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REFERENCES

1. Taxicab Operating Characteristics. Control Data Corp., Rockville, MD, March 1977.
2. J. D. Wells and F. F. Selover. Characteristics of the Urban Taxicab Transit Industry. In Economic Characteristics of the Urban Public Transportation Industry, Institute for Defense Analyses, Arlington, VA, 1972.
3. G. Gilbert. Taxi Innovations in Demand-Responsive Transit. Proc., Conference on Taxis as Public Transit (G. J. Fielding and R. F. Teal, eds.), Univ. of California, Irvine, Dec. 1978.
4. R. Remak. Potential for Flexicab Services: Innovative Use of Taxis and Jitneys for Public Transportation. Office of the Secretary, U.S. Department of Transportation, Dec. 1975.
5. R. F. Teal. Taxis as Public Transit. Proc., Conference on Taxis as Public Transit (G. J. Fielding and R. F. Teal, eds.), Univ. of California, Irvine, Dec. 1978.
6. S. Sonenblum, J. J. Kirlin, and J. C. Ries. How Cities Provide Services. Ballinger Publishing Co., Cambridge, MA, 1977.
7. D. M. Alschuler and M. Flusberg. Establishing Contractual Relationships for Demand-Responsive Transportation Services. TRB, Transportation Research Record 608, 1976, pp. 107-112.
8. A. A. Altshuler. The Federal Government and Paratransit. In Paratransit, TRB, Special Rept. 164, 1976, pp. 98-104.
9. E. Zolla III. Labor Requirements Under Shared-Ride Taxi Systems. Proc., Conference on Taxis as Public Transit (G. J. Fielding and R. F. Teal, eds.), Univ. of California, Irvine, Dec. 1978.
10. D. M. Alschuler. Labor Protection, Labor Standards, and the Future of Paratransit. In Paratransit: 1979, TRB, Special Rept. 186, 1979, pp. 8-20.
11. R. Gundersen. Legal Aspects of Paratransit Deployment. Proc., Conference on Taxis as Public Transit (G. J. Fielding and R. F. Teal, eds.), Univ. of California, Irvine, Dec. 1978.

Evaluation of the Commuter Computer Vanpool Program

PETER J. VALK

An evaluation of the Los Angeles area multiple-employer vanpool program called Commuter Computer Vanpool is presented. The purpose of the study is to describe how the program works and to provide an evaluation of past performance and input for future policymaking. Three years of experience in marketing the program have produced several important findings: (a) The ridesharing market does not include all commuters but is composed of several specialized segments that desire certain services, (b) the most critical element in making a vanpool program successful at worksites is commitment to the program by top management, and (c) participants in the program are predominantly former ridesharers and live approximately 35 miles from work (one way). The program has been a mechanism for increasing vehicle efficiency rather than getting people out of single-occupant vehicles. The decision to vanpool is found to be not entirely an economic choice in that it is more strongly influenced by psychosocial pressures than by economic ones.

This paper is based on an evaluation report that was produced to fully describe the Commuter Computer Vanpool program as it operated in the Los Angeles metropolitan area from April 1976 through October 1978 (1). The original evaluation had two primary objectives. The first was retrospective in nature--that is, to determine the past performance of the pilot vanpool program and report on significant experiences. The second objective was to provide information that could be applied to the development of marketing strategy and decisions on future program directions. Since significant changes have been made in the program since then, portions of this paper must be viewed as a retrospective evaluation.

BACKGROUND

During the 2.5-year period analyzed in this paper, Commuter Computer Vanpool (CCVP), the operator of a 140-vehicle vanpool fleet, successfully served more than 1470 Los Angeles area commuters. Table 1 gives data on vanpool participation by month from May 1976 to June 1978. The program was initiated through support from the Atlantic Richfield Company (ARCO), the California Department of Transportation (Caltrans), the Southern California Automobile Club, Crocker National Bank, Security Pacific National Bank, and other private and government supporters.

The program sponsors chose to test the concept of luxury vanpooling. The "product" is a 10-passenger van that is outfitted with luxurious appointments such as airline-type seating and AM/FM radio with individual headphone outlets. In addition, each vanpool receives individual attention, including backup vehicles, assistance in searching for potential riders, and individual fare billing

statements. These product characteristics, which appeal to one portion of the vanpooling market, make the results of the CCVP concept transferable to other programs only to the extent of the similarity of product characteristics.

CCVP does not have a staff of its own but contracts with Commuter Transportation Services, Inc. (CTS), for staff support. This support includes the administrative and marketing services necessary to attract and maintain ridership. CTS maintains a vanpool department that is responsible for all vanpool activities, including matching services and fleet administration functions. The majority of the fleet administration division's resources have been spent on routine maintenance of vehicles, a function that in other programs is explicitly delegated to the driver. The lack of driver responsibility for vehicle operation and maintenance (including collection of fares, maintenance of the vehicle, and search for potential rides) has severely increased the burden on CCVP, a problem that other programs have avoided.

Table 1. Participation in CCVP program by month: May 1976-June 1978.

Year	Month	No. of Commuters	No. of Passengers	Passenger Occupancy (%)
1976	May	13	124	95
	June	14	133	92
	July	18	171	95
	August	19	181	95
	September	20	190	95
	October	20	190	95
	November	20	190	95
	December	20	190	95
1977	January	35	333	95
	February	51	415	81
	March	57	542	95
	April	68	646	95
	May	69	656	95
	June	69	656	95
	July	68	651	96
	August	75	709	95
	September[a]	77	674	88
	October	81	699	86
	November	82	690	84
	December	86	697	81
1978	January	84	704	84
	February	85	695	82
	March	85	714	84
	April	91	779	85
	May	87	751	86
	June	103	791	86

[a]Fare increase of 20 percent.

VANPOOL MARKETING

The most important finding from the CTS-CCVP sales effort is the critical role that top management support has played in making the program successful. If top management perceives that ridesharing serves its business interests, vanpooling is likely to be a success. Strong commitment in the form of consistent staff support and employee incentives (payroll deductions, subsidies, preferential parking, and/or van underwriting) has proved necessary in making vanpooling attractive to commuters.

Marketing results at employment sites where management has not fully committed itself to ridesharing (i.e., where there has been only a limited expression of endorsement) reflect a low level of participation. This contrasts with situations where employers go beyond tacit endorsement and actually participate in the "delivery" of the vanpool (or ridesharing) marketing effort. The significant results found in those cases reflect the effort management puts into the program.

The importance of a strong commitment by top management to making a vanpool program work is evident in the employee composition of such a program. Almost 75 percent of CCVP vanpoolers are employed by one or another of 16 large firms; almost half of the total vanpoolers are ARCO employees. Figure 1 shows the employer composition of the program.

Not all companies, however, are candidates for the CCVP program. Market research into the characteristics of employment sites can develop information that will measurably improve the fruitfulness of marketing and thus help to keep ineffective spending down.

CTS-CCVP experience during the 1976-1978 period clearly shows that marketing success must be evaluated on a case-by-case basis. The success of the marketing process at an employment site depends on a multitude of variables unique to that site. Critical issues range from the predisposition of an organization's chief executive toward ridesharing to the size of the parking lot (or the lack of one) at a facility. It is the interaction of these variables that either makes or breaks a marketing effort.

The 1976-1978 period also showed that the market for vanpooling does not include all commuters, even if they meet the minimum distance threshold of 15 miles. Only those who meet this mandatory distance

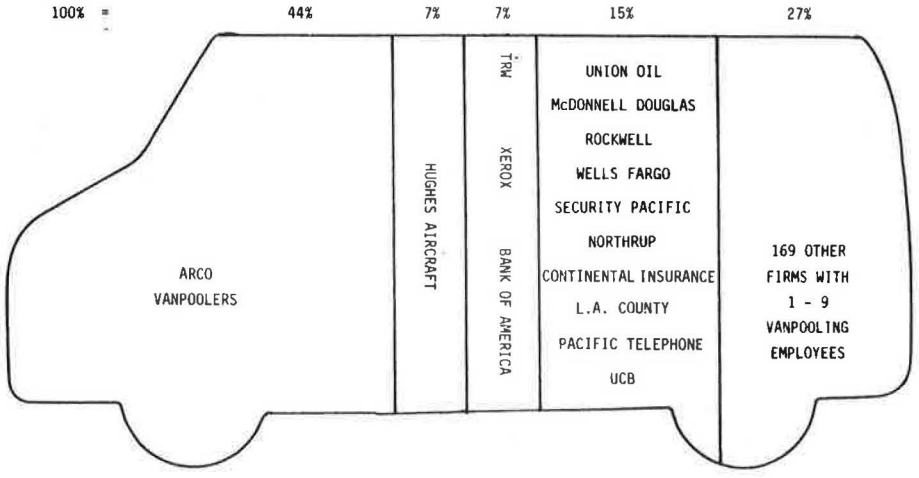


Figure 1. Employer composition of CCVP program.

requirement and can be accommodated in a rideshare mode can be considered part of the potential market. Even within this group, however, there are "direct" and "indirect" marketing segments: The directly reachable population consists of those who attend sales presentations, and the indirect market (which is often influenced by members of the direct-market population) consists of persons who meet the minimum criteria but are only marginally exposed to sales efforts. Figure 2 shows the market segments that CTS considers in its marketing of transportation services.

Often, approximately 30 percent of those who eventually become vanpoolers are reached by direct marketing efforts (i.e., sales presentations). The remainder of the vanpoolers find out about vanpooling by word of mouth and other more personal sources of information. This is the indirect market segment. Indirect marketing has the potential for reaching a far greater audience.

Another function of the vanpool department of CTS is to actually form vanpools. This activity involves a number of responsibilities, including identifying individuals who are interested in vanpooling and who share common home-to-work travel patterns, finding and training a qualified driver, establishing an initial route, and placing the van in service. Vanpool routes usually take about six months to assemble and implement. Follow-up activities are designed to maintain the ridership at full complement.

The "third-party" matching function performed by CTS has enabled a number of employees to participate in a vanpool program when an "in-house" program was not possible. This "personalized" approach is critical in a multiple-employer program in which drivers are not given the responsibility for securing and maintaining ridership. CTS experience with the development, demonstration, and operation of the third-party personalized matching function over the 1976-1978 period will in the future be applied to a variety of commuter modes, such as taxipools and buspools.

VANPOOL OPERATIONS

CCVP operates a leased fleet of 185 vans, 170 of which are available for commuter use. The vehicles--Dodge B-3000 1-ton Maxi-Vans--have primarily been converted for use as 10-passenger luxury commuting vans. Fares are based on the total (fixed plus variable) operating costs and include an assessment for payment of CTS support charges. This fixed-cost component was intended to cover CTS start-up and ongoing costs, but in reality it only covers ongoing costs. The largest component of the fare structure is lease cost, which accounts for 45 percent of the fare. Insurance coverage, which is set at a $10 000 000 combined single limit, also increases the cost of vanpooling. Variable operating costs are largely made up of gasoline costs (70 percent) and are assessed to passengers based on their actual vanpool route mileage. Figure 3 shows the average monthly cost of maintaining the vanpool fleet between January and June 1978 (for 90 operating units).

Accident repairs have been minimal over the 2 600 000 miles logged by CCVP vehicles, but maintenance costs for engine work on vehicles that have logged 20 000-35 000 miles have been greater than anticipated. These fluctuations in costs have led to several upward revisions of fare schedules for CCVP riders. An overall 18-20 percent fare increase was put into effect in September 1977. Not only did this added cost reduce existing ridership by 15 percent, but also several vanpool routes that were forming never materialized. This factor, coupled with the delivery of 100 vans in November and December 1977, has led to a serious problem with unfilled vans and has affected CCVP cash flow.

To investigate improved methods of marketing the CCVP program, CTS applied for and received a $254 100 grant from Caltrans to test the Vanpool Marketing Incentive Demonstration Project. This program offers a fare-reduction incentive and a "finder's fee" for finding new vanpoolers and subsidizes vacant seats so that vehicles can be put on the road at five riders plus driver rather than the requisite eight riders plus driver. An evaluation of this grant was completed in August 1979 (2).

Although this paper does not address the concepts that were tested in the demonstration project, the following are several of the findings from the report:

1. Vanpool formation under the demonstration project was more successful at large work sites.
2. Company marketing produced a higher rate of vanpool formation than it did before the demonstration. In addition, the finder's fee contributed to the forming of a large number of vanpools as a result of individual call-ins.
3. According to a February 1978 survey of vanpoolers, the demonstration did not attract a higher proportion of solo drivers than had previously been the case, at least among those who stayed with the program. However, the proportion of solo drivers was in fact greater among those who eventually dropped out. Those who dropped out tended to use some other form of ridesharing (primarily carpooling), which indicates that the experience of vanpooling helped to change travel behavior among drivers who previously drove alone.
4. According to surveyed riders, the reduced fare was not the primary factor in their decision either to join or to leave the program.

The complete findings and recommendations on the demonstration project are presented in the final CTS report by Lichterman (2).

Fares are billed in advance and collected through individual rider statements; however, several requesting companies are invoiced for their employee participants in CCVP. Companies can then seek as much compensation from their employees as they desire. These complex procedures reflect the degree of detail that CTS-CCVP has developed in order to provide vanpoolers from many companies with the same level of service that they would receive if they participated in an in-house program.

Single-employer vanpool programs can take advantage of existing in-house administrative practices and modify them to reflect changing worker needs (e.g., changing a free-parking incentive to a multimodal transportation incentive). However, a multiple-employer transportation program must create procedures that cross company structures and also maintain tight control of financial practices. These necessary functions eventually end up costing more and, unlike the in-house programs, CTS-CCVP cannot assume (or bury) any of these costs.

VANPOOLER CHARACTERISTICS

CCVP vanpoolers are predominantly former ridesharers: One-quarter of them had carpooled prior to vanpooling and almost one-third had used the bus (usually express bus) to get to work. The largest group of former ridesharers is found among drivers, which suggests that former carpoolers saw vanpooling

Figure 2. Market segments for luxury vanpool service.

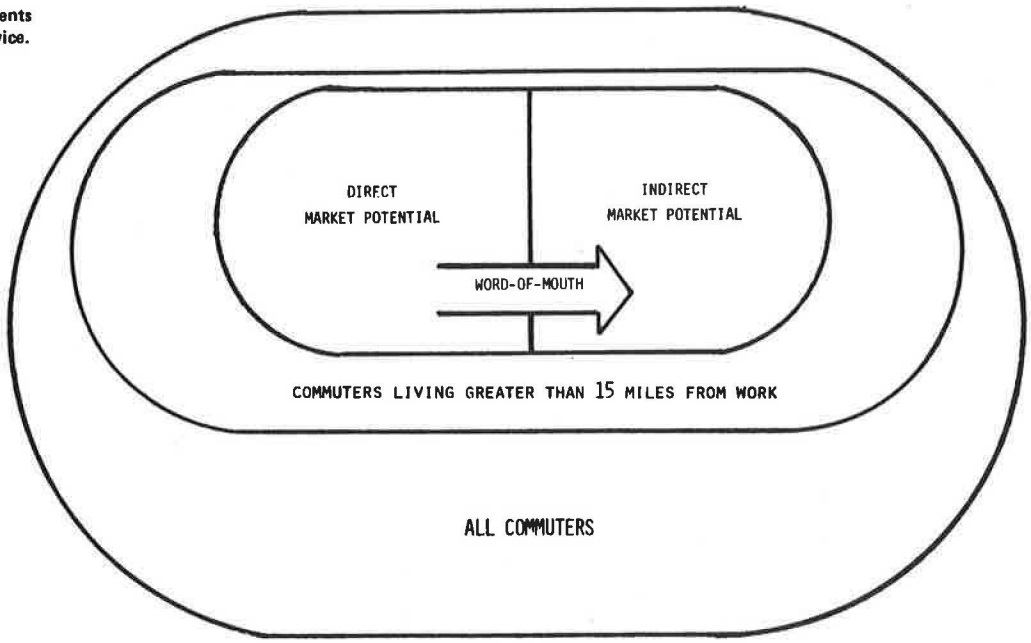
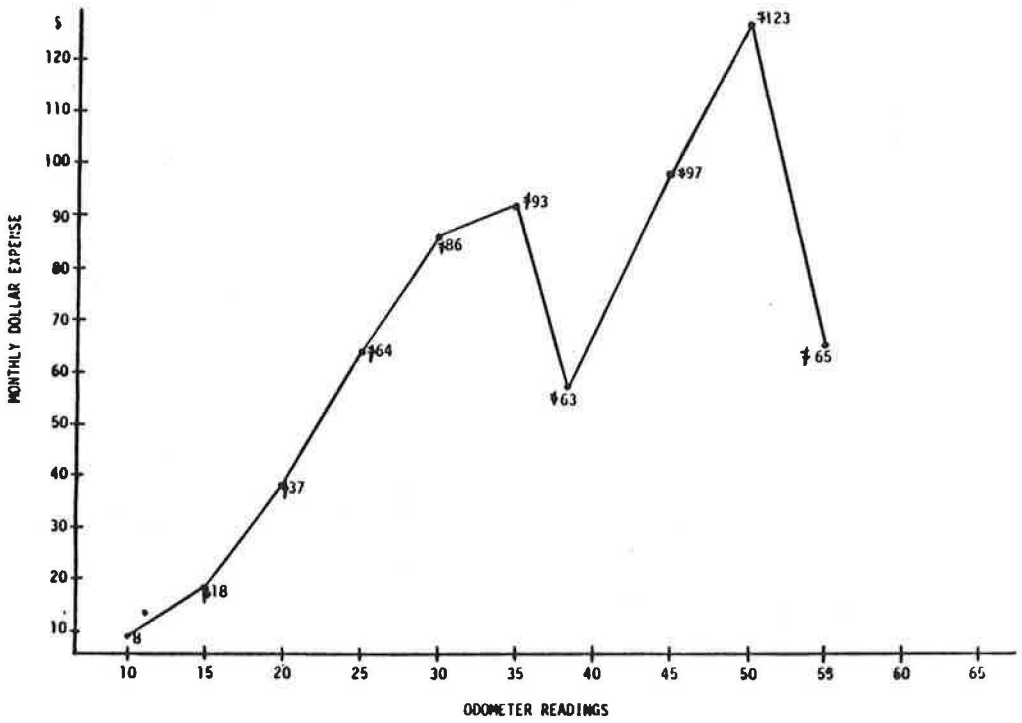


Figure 3. Monthly average maintenance expense in 1978 for vanpool fleet by age of vehicle.



as a way to continue sharing a ride (and costs) while relieving themselves of using their personal vehicle for commuting. The following table gives prior-mode characteristics for all vanpoolers, categorizing vanpoolers as drivers and riders:

Prior Mode	Number	Composition (%) Drivers	Riders
Drive alone	191	32	40
Carpool	130	41	23
Bus	162	27	32
Other	26	0	5
No response	10		

The average round-trip distance in the CCVP area is almost 72 miles. Travel distance is found to have a strong effect on former mode of travel. Figure 4 shows this point by charting distance traveled to work by prior mode.

Overall vehicle occupancy prior to vanpooling was 1.9 persons/vehicle, which is significantly higher than the Los Angeles average.

Most vanpoolers have not taken advantage of the program to reduce personal vehicle ownership, but almost half of the vanpoolers reported savings in personal vehicle insurance. The low reduction in vehicle ownership may be explained partly by the need riders expressed for a vehicle to take them to

a van pickup point. Only 35 percent of the vanpoolers reported leaving a vehicle at home, and only 15 percent of the total group reported an increase in the use of vehicles left at home. This might be caused partly by policies on vanpool route selection, which minimize actual van miles and cause riders to travel greater distances to pickup points, significantly reducing potential air-quality benefits. Perhaps these policies should be reexamined.

CCVP users are more affluent, have larger families, and hold better jobs than the average commuter. As might be expected, those who take advantage of the more permanent benefits of the program (a reduction in vehicle ownership) have been in the program for more than 21 months.

Travel and demographic characteristics can foretell a commuter's predisposition toward ridesharing, but it is the social and psychological factors that are critical in understanding the structure of the ridesharing phenomenon. CCVP users predominantly chose vanpooling because of its "nonmonetary" benefits, thus reinforcing the hypothesis that vanpooling is not entirely an economic phenomenon and, correspondingly, is not always sensitive to economic pressures. More importantly, CCVP users are overwhelmingly satisfied with the program. Those who previously shared rides do evaluate the program more positively than those who previously drove alone.

The findings of a 1977 research study of carpoolers in the Washington, D.C., area by Margolin, Misch, and Stahr (3) emphasized that interpersonal factors were found to be the most important variables in carpool formation and that most carpools were formed among those who had some prior association. The implication of these findings is a strong resistance on the behalf of commuters to becoming involved in an activity with people they do not know. Findings from the study of CCVP participants support both of these statements.

In summary, most vanpoolers were predisposed to ridesharing before being introduced to the program. After receiving what they considered valid information and/or evaluations about the program from some personal contact, they sought out this transportation alternative. Having done so, they immediately enjoyed the noneconomic benefits of vanpooling but give some indication of discomfort with having selected a mode for reasons of personal convenience and not economics (the reverse of the process for those whose former mode was the single-occupant vehicle).

CCVP has been a mechanism for further increasing vehicle efficiency rather than getting people out of single-occupant vehicles. Further efforts toward this end will require either a more effective portrayal of noneconomic benefits or a reduction in fares to lure carpoolers into vanpools.

PROGRAM COSTS AND BENEFITS

Total expenditures for the vanpool program during FY 1977/78 were estimated at about $6000 (which accounts for both steady and growth phases of the program), or about one-third of total CTS expenditures. The apportionment of these costs between the two programs is necessarily subjective, since many CTS activities support the carpool and vanpool programs simultaneously. Thus, the figure cited above must be recognized as a rough estimate.

An estimation of the effectiveness of the CCVP program in generating both economic and environmental benefits is critical to determining the proper role of vanpooling in the mix of regional commuter transportation alternatives. The primary indicators in determining benefit generation are the reduction in vehicle miles traveled and the change in commuter trips that is associated with vanpooling. These two figures are the source for calculating air-quality benefits, energy reductions, reduced peak-period congestion, and user cost savings.

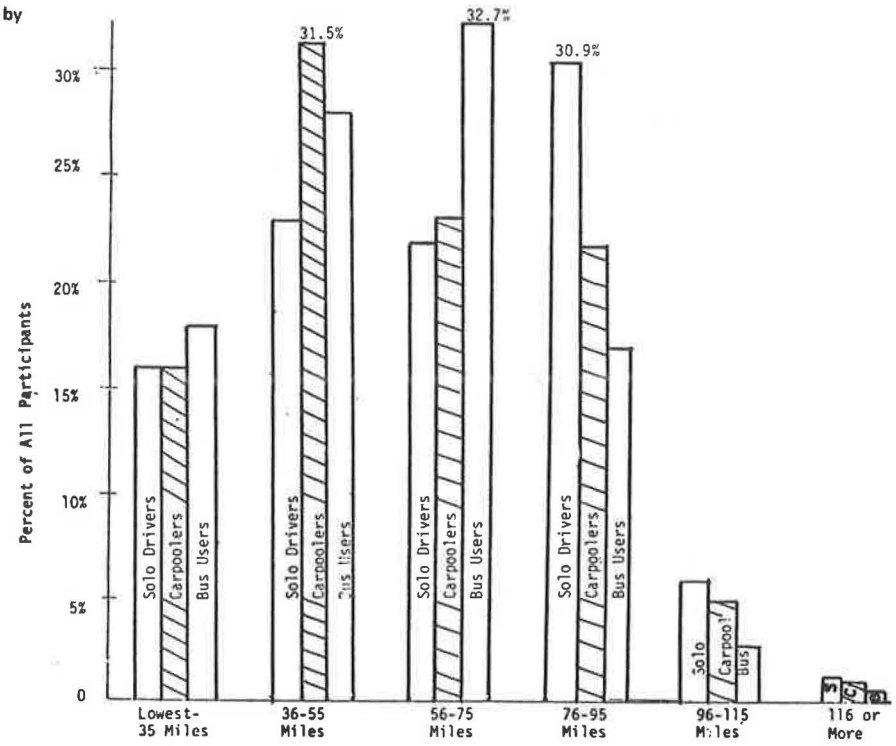


Figure 4. Distance CCVP participants traveled by their former mode.

Table 2. Cost-effectiveness of CCVP program for FY 1977/78.

Program Objective	Assigned Cost		Measure of Effectiveness	Cost-Effectiveness
	Amount ($)	Percent		
Reduce energy consumption[a]	165 000	25	192 500 gal	$0.86/gal
Reduce air pollution	165 000	25	159 400 lb	$0.75/lb
Reduce commuter costs[a]	132 000	20	$277 400 saved	$0.47/dollar saved
Reduce traffic congestion	66 000	10	137 650 trips	$0.48/line-haul trip reduced
Reduce parking demand	66 000	10	400 spaces	$150/space
Improve commuter mobility	66 000	10	Unknown	Unknown
Total	660 000			

[a]Identification of individual cost savings is based on the reduction of vehicle miles traveled and the appropriate cost per mile to operate a vehicle. Although this is a direct saving to commuters, it is also considered by some to reflect a reduction in energy consumption. Thus, the separation of reduced commuter costs and reduced energy consumption could be interpreted as "double counting" of program benefits.

Table 3. Impacts of CCVP program by quarter: May 1976-June 1979.

Item	Quarter	1976	1977	1978	1979[a]
Commuter vans in service at end of quarter	1	–	57	85	141
	2	14	69	101	137
	3	20	77	127	
	4	20	86	145	
Current vanpoolers at end of quarter	1	–	542	714	1015
	2	133	656	814	1263
	3	190	674	998	
	4	190	697	1177	
Vanpoolers who dropped out during quarter	1	–	90	148	244
	2	17	137	183	256
	3	37	142	216	
	4	39	146	290	
Total program participants during quarter	1	–	632	1163	1259
	2	150	793	997	1519
	3	227	816	1214	
	4	229	843	1467	
Reduction in vehicle miles of travel (000s)	1	–	467.3	830.0	1408.5
	2	88.2	673.2	911.7	1576.2
	3	168.3	719.0	1150.3	
	4	196.1	813.7	1388.9	
Reduction in line-haul vehicle trips (000s)	1	–	26.1	34.4	49.0
	2	6.4	31.7	39.3	57.6
	3	9.1	32.5	48.2	
	4	9.1	33.6	56.8	
Local collection-distribution trips produced (000s)	1	–	32.2	42.4	60.2
	2	7.9	38.9	48.3	124.0
	3	11.2	40.0	59.2	
	4	11.2	41.4	69.9	
Net production of vehicle trips (000s)	1	–	6.1	8.0	11.2
	2	1.5	7.2	9.0	66.4
	3	2.1	7.5	11.0	
	4	2.1	7.8	13.1	
Fuel saved (gal 000s)	1	–	29.2	51.9	88.0
	2	5.5	42.0	57.0	92.2
	3	11.6	44.9	72.9	
	4	12.2	50.9	86.8	
Reduction in air pollution emissions (lb 000s)	1	–	29.8	55.2	95.7
	2	5.3	44.2	60.5	32.2
	3	12.1	47.4	76.6	
	4	12.9	54.2	92.7	
Commuter (user) cost savings ($000s)	1	–	40.1	68.4	108.3
	2	8.3	63.3	75.7	62.8
	3	17.5	65.8	89.4	
	4	18.4	67.5	109.0	

[a]Beginning in the second quarter of 1979, estimates of program impacts are based on revised and updated methods developed by the Commuter Computer planning staff.

A revised methodology for calculating program benefits was developed to refine some of the previously used procedures and to incorporate information concerning actual vanpooler characteristics (e.g., the use of vehicles left at home and access to pickup points). The following vanpool program impacts for FY 1977/78 were determined by using the new methodology:

Impact	Amount
Reduction in vehicle miles traveled	3 080 000
Vehicle trips	
Increased local collection-distribution	169 290
Reduced line-haul	137 650
Gasoline savings (gal)	192 500
Reduction in air pollution emissions (lb)	159 400
Reduction in parking-space demand (spaces)	400
User cost savings ($)	277 400

Finally, a cost-effectiveness analysis was done to find out how effective the vanpool program is per dollar spent. This kind of information is essential if transportation planners, policymakers, and funders are to properly compare the vanpool program with other transportation improvement programs so that limited resources can be allocated to produce the greatest public benefits.

First, the objectives of the vanpool program were enumerated. Since, like the Commuter Computer carpool program, the vanpool program achieves all objectives simultaneously, total program expenditures were apportioned across the multiple objectives. Next, the results of the benefit calculations were applied to measure the effectiveness of the program in achieving each objective. Finally, the costs allocated to each objective were weighted against the measure of effectiveness for that objective in order to measure the cost-effectiveness of the vanpool program with respect to that objective (4). The results of this analysis are summarized in Table 2.

This type of analysis permits the vanpool program to be compared with other transportation improvement programs, even those that do not have an identical set of program objectives. Such comparisons must be made if transportation funds are to be optimally allocated. Experience indicates that these comparisons will generally find the vanpool program to be a highly cost-effective element in comparison with other commuter services that serve the same market segment.

Relevant comparisons would include traditional transit alternatives to long-distance commuting, such as park-and-ride. Comparisons with carpooling programs reveal that carpooling programs are highly cost-effective in relation to the objectives cited in Table 2. Ridesharing decision makers are thus presented with several options--all aimed at achieving environmental and economic objectives--as a basis for selecting a level of resource commitment.

Table 3 gives data on program impacts by quarter for the 1976-1978 period as well as estimates for the first two quarters of 1979.

REFERENCES

1. P.J. Valk. Vanpool Evaluation Report. Commuter Transportation Services, Inc., Los Angeles, April 1979.
2. T.I. Lichterman. Final Evaluation Report: Vanpool Marketing Incentive Demonstration Project. Commuter Transportation Services, Inc., Los Angeles, Aug. 1979.

3. J.B. Margolin, M.R. Misch, and M. Stahr. Incentives and Disincentives of Ridesharing. TRB, Transportation Research Record 673, 1978, pp. 7-15.

4. L.J. Glazer. San Bernardino Freeway Express Busway: Evaluation of Mixed-Mode Operation. Southern California Assn. of Governments, Los Angeles, July 1978.

Knoxville Brokerage Demonstration: A Retrospective View

RICHARD D. JUSTER

Results of an extensive evaluation of the Knoxville transportation brokerage demonstration, the first metropolitan, multimodal implementation of the brokerage concept, are presented. The demonstration involved the establishment of the Knoxville Commuter Pool, an organization that sought to identify and match transportation demand and supply among a variety of users and providers. Primary emphasis was on service to two market segments: commuters and social service agencies. Although the Knoxville experiment in brokerage was very successful in achieving institutional changes conducive to the growth of shared-ride modes, its impact on travel behavior was quite limited. Nevertheless, the flexibility inherent in the brokerage concept may be a key in the search for better solutions to transportation problems. Continued research in this area, as well as the rising cost and decreasing availability of energy, may significantly increase the impact of future brokerage organizations on their communities.

A transportation broker identifies and matches the needs of individual travelers with a range of existing and/or new transit services to provide a more efficient and effective transportation system. The broker often acts as an advocate for shared-ride modes (e.g., carpooling, vanpooling, and conventional mass transit) and in this capacity may work for whatever institutional or regulatory changes are required to facilitate their wider use.

From October 1975 to December 1978, Knoxville, Tennessee, was the site of a demonstration of the nation's first metropolitan transportation brokerage service, conducted as part of the Service and Methods Demonstration (SMD) program of the Urban Mass Transportation Administration (UMTA). The SMD evaluation report (1), on which this paper is based, covered the first 32 months of the demonstration (the "evaluation period") in detail, from its inception until June 30, 1978; however, where they were available, data on the final 6 months of the project were incorporated.

The Knoxville broker--known publicly as the Knoxville Commuter Pool (KCP)--was initially operated by the Transportation Center of the University of Tennessee under contract to the city of Knoxville (the official grantee). After 20 months, operations were moved to the newly formed Knoxville Department of Public Transportation Services. Although the KCP service area nominally included the 16 counties of the East Tennessee Development District, brokerage activities focused on the considerably smaller Knoxville standard metropolitan statistical area (SMSA), which had a 1975 residential population of 435 400 (2) and an estimated work-force population of 194 600 (1).

PROJECT BACKGROUND AND SCOPE

Express bus and commuter ridesharing programs in Knoxville date back to 1973, when the first of a series of successful express bus routes serving the downtown was implemented. From the outset, employees of the Tennessee Valley Authority (TVA), the downtown's largest employer, formed the nucleus of the service's ridership. In 1975, TVA introduced its Commuter Pooling Demonstration Program, which provided its 3100 employees with monetary incentives for shared riding and assistance with carpool and vanpool formation. (The TVA credit union had also just initiated a vanpool leasing demonstration.) The TVA incentive program further spurred the growth of express bus services; within two years, 22 routes were in operation. This program also provided an example of how effective a comprehensive ridesharing program could be under the best of circumstances (i.e., strong management commitment by a single large employer, financial incentives, and a shortage of parking). From November 1973 to January 1976, the percentage of TVA downtown employees who drove alone dropped dramatically, from 65 to 19 percent (3).

Concurrently with the growth of express bus services, the Transportation Center of the University of Tennessee was engaged in a study of employer-based rideshare matching for the U.S. Department of Transportation (DOT). A major conclusion of that effort was that a brokerage system involving a broad range of transit and paratransit modes seemed the most promising approach to solving many traditional transportation problems (4). To implement and test this recommendation, the city of Knoxville, with the assistance of the University of Tennessee, applied to UMTA for demonstration funding in April 1975.

The original scope of the brokerage project was extremely broad (5), encompassing all of the following tasks:

1. Identify the travel demand of commuters, social service agencies and clients, and the jobless, as well as the potential demand for goods movement (prearranged travel only);
2. Identify the range of existing and potential transportation suppliers, including public and private operators and individuals who have cars or vans available for ridesharing;