

as regional transit projects are implemented, as parking prices rise, and as the positive interactive effects of ridesharing programs currently being established manifest themselves.

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Part-Time Carpooling: A New Marketing Concept for Ridesharing

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ABSTRACT

The most common objection of solo drivers to carpooling is lack of flexibility. Part-time carpooling (two persons 2 days per week) appears to answer much of this objection. A demonstration project was undertaken to test the effectiveness of part-time carpooling, identify the nature of the market for this concept, and determine what elements contribute most to the success of this type of undertaking. Participants were asked to commit to a two-person carpool 2 days a week for 3 months. A total of 212 people registered, which indicated that the market size for part-time carpooling is approximately 5 percent of the drive-alone commuters at the demonstration site. Half of the registrants had had no previous carpooling experience, and there was a higher-than-normal spread in work schedules. Of the 212 registrants, 100 were matched in potential carpool groups, and 44 people formed new, part-time carpools. There was no ongoing matching support, which may explain in part the high attrition rate (75 percent in 8 months). This demonstration project indicates that part-time carpooling is a promising technique for reaching beyond the commuter market segments traditionally served by conventional ridesharing programs.

The most common and strongest objection voiced by solo drivers to ridesharing is lack of flexibility. Every ridesharing professional who has contact with commuters hears this objection more often than any other. Studies in Los Angeles (1) and elsewhere have found that the perception of the inflexibility of ridesharing is the single largest barrier to acceptance of the idea among solo-driver commuters.

This appears to be a major reason why fewer than one-third of all commuters who are offered free ridesharing information will even bother to apply for this service. It may also explain in large part

why such a small percentage, typically 5 to 15 percent, of those who do apply for ridesharing matching services actually use that information to join or form a carpool (2).

If significant improvements are to be realized in the carpool placement rates that result from ridesharing efforts, something must be done to overcome this common objection of solo drivers. The potential for improved placement rates is enormous. If half of all commuters who voice this objection were to be won over by the part-time carpooling concept, the typical ridesharing placement rate would almost double.

This demonstration project was an attempt to directly and strongly respond to this objection by offering commuters a highly flexible ridesharing program--part-time carpooling. The organizers of this demonstration believed that promotion of this concept

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would correct the common misperception of the inflexibility of carpooling and thereby increase the percentages of solo drivers who adopt this ridesharing mode. The clearest way to test this belief was to conduct a demonstration of this new concept for marketing ridesharing and then evaluate the results.

The demonstration project was conducted at the El Segundo site of the Hughes Aircraft Company, Space and Communications Group (SCG). El Segundo, which is a high-density, suburban employment site, is located on the west side of the greater Los Angeles area immediately south of the Los Angeles International Airport. El Segundo contains both residential and high-density office development. Total employment in the El Segundo area is about 60,000 at present, and employment density is 20,690 employees per square mile. There are approximately 14 million square feet of occupied office space.

Office development is continuing, and concern about traffic impacts is relatively high among both residents and developers. The El Segundo Employer's Association (ESEA) was created, in large part, to address those concerns and to explore traffic-mitigation measures.

Approximately 6,500 employees of SCG are located in the main plant facility in El Segundo. Because SCG is an aerospace engineering and research facility, more than 82 percent of the employees have management/administration and professional/technical job descriptions. The remaining 18 percent of SCG employees may be classified in secretarial/clerical, service, and production job categories. This is a higher-than-average percentage of executive and professional employees, who are traditionally those with the greatest perceived needs for flexibility in commuting.

Before the demonstration project, roughly two-thirds of SCG employees drove to work alone. About 70 percent of SCG employees commuted less than 15 mi one way to work. Public transportation service is limited, as is the case in most suburban employment centers; 14 bus routes carry about 1.2 percent of the home-to-work trips of El Segundo employees. It should be noted that there are only two publicly funded express commuter bus trips into the city each day; all other service is local and generally not oriented toward providing commuter service to El Segundo.

When the demonstration project began, SCG had an active ridesharing program. The Commuter Services Office administered a fleet of 20 company-owned vans that were used for pools and provided route and schedule information and ticket sales for the Hughes-sponsored bus system that serves Hughes employees living within a 15-mi radius of the El Segundo plant. The Commuter Services Office also offers a carpool-matching service, bicycle information, public transportation (bus) route and schedule information and monthly pass sales, and information about private commuter bus operations serving the area.

The demonstration environment offered both the facilities needed to conduct such an experiment and circumstances that are not unlike those of many suburban employment centers. Thus the results should be reasonably reliable and transferrable to other locations.

DESCRIPTION OF THE PROJECT

Objectives

At the outset, this demonstration project had three major objectives. Listed in order of priority, they were to

1. Determine the effectiveness of the part-time carpooling concept for increasing carpool placement rates and, if possible, measure long-term attrition rates and the maintenance effort required to keep these carpools together;
2. Identify the nature of the market for part-time carpooling, especially in terms of the characteristics and attitudes of the "customers" (i.e., those who adopt the concept); and
3. Identify the elements that contributed most to the success of the project and are transferrable to replications elsewhere.

General Approach

A "part-time carpool" was defined as a two-person carpool operating 2 days per week for a 3-month trial period. Commuters would be asked to make only this minimum commitment. Of course, it was entirely permissible for carpools to exceed the minimum requirements. The idea was to promote a concept that offered maximum flexibility in order to overcome the initial objections of those who believed conventional carpooling was too inflexible. As will be seen later, some of these minimums were voluntarily exceeded.

The target market was defined as commuters with strong needs for flexibility, especially in trip chaining but also with regard to schedules. ("Trip chaining" refers to the common practice of making several trips in sequence; for example, going from work to the grocery store to home.) Special needs must be known at least 1 day in advance so that carpool arrangements can be altered if necessary.

Compatibility of social factors must also be taken into account, as is true with other forms of carpooling. The demonstration would include personalized matching for at least some of the applicants so as to take into account the many subjective factors that can affect the viability of a carpool arrangement.

CHRONOLOGY OF EVENTS

The project officially began in October 1982, but external factors did not permit activities to begin until February 1983. The project concluded in September 1984. A brief summary of major project actions follows. Further details about these activities are contained in the Project Status Reports, available from ESEA.

- February 1983: First project meeting. Theme development discussed. Idea of "twofers" (two people ridesharing 2 days a week) arose. Concepts and functions of posters discussed. It was decided that two teaser posters would be used throughout the plant to arouse curiosity followed by a regular poster announcing the program. Using paycheck stuffers and prizes to attract participants discussed.

- April 1983: Concepts developed for posters reviewed. Twofers concept chosen.

- May 1983: Artwork for two teaser posters and announcement poster approved. Teaser poster said "the twofers are coming" and "the twofers are coming/you two can make a difference." The announcement poster explained the project. Discussion of paycheck stuffers, "Do's and Don't's" list for participants, card thanking participants for interest, and free lunch. Development of artwork for paycheck stuffer begun.

Decision made to provide free lunch, as get-acquainted meeting, as prize to all matched participants and to hold a drawing (for participating matched employees) for dinner for two at a restaurant of the winner's choice (\$100 limit). Lunches provided

by Hughes SCG at facility cafeteria, dinner provided from project funds.

- June 1983: Approval of artwork for paycheck stuffer, Do's and Don't's list, participant interest cards, and lunch tickets. Schedule set for delivery of materials. Costs: graphic artist, \$1,322 and printing of posters and paycheck stuffers, \$1,904.

- July 1983: Distribution of teaser posters with assistance of 50 Commuter Services Representatives in divisions of SCG. First teaser poster displayed for 1 1/2 weeks. Second teaser poster displayed for 1 week immediately following first poster. Announcement poster displayed immediately following second teaser poster. Article in SCG newspaper explaining twofers program and paycheck stuffer and including registration form. Personalized matching stressed in paycheck stuffer; prizes also mentioned.

- August 1983: Registration forms received (212 in first 3 weeks). Each registrant was immediately sent a follow-up card explaining matching process and delay required for all registrations to be received.

- September 1983: Matching performed initially ignoring work schedule, which was not requested on registration form. Program applicants found to have more widely varying work schedules than had been thought to be the case for the entire work force.

Personalized matching begun with follow-up telephone calls to each registrant to obtain further information and to distribute names of prospective partners. Costs for hand matching and telephone follow-up survey: \$1,398 (approximately 198 person-hours).

When a final match had been arranged, participants were contacted and the complete program was explained. Participants were asked to make a commitment to form a two-person carpool 2 days a week for 3 months. Follow-up correspondence was sent, including restatement of required commitment, name and telephone number of partner, ticket for get-acquainted lunch, "Twofers Do's and Don't's" commuting tips, and information on drawing for free dinner.

Get-acquainted lunches at SCG cafeteria (lunch tickets required both partners to appear together). Cost: \$226 (borne by Hughes SCG).

- October 1983: Winner of free dinner drawn randomly from registrants. Winner's carpooling status verified before presentation of gift certificate for \$100 at restaurant of his choice.

- May 1984: Second survey conducted to determine continued participation of program poolers and long-term effects on attitudes. Survey results tabulated.

- September 1984: Final report written. Project completed.

EVALUATION OF RESULTS

In this section the findings of the project are presented. In the first subsection, the tangible and quantitative results of the demonstration project are presented. The second and third subsections are about the results of the two surveys of participants, and both quantifiable results (e.g., carpool formation rates) and subjective findings (e.g., attitudes) are presented.

Matching Statistics

Of the 212 program registrants, 100 were matched and 112 were not. Because the small data base limited matching opportunities, several sources were used for matching, including the registrant file, Commuter Computer (the areawide ridesharing agency), and personal contacts.

Among the 100 people who were matched, 49 potential carpool groupings were identified. (Two of these had three people.)

Of the 112 registrants who were not matched, 40 lost interest between the time they filled out the form and the time the matching was done. Matches were not available for the remaining 72 registrants; or they were not reachable by telephone, had moved, were already carpooling, or just filled out the survey for the prizes.

There were several reasons why registrants who were still interested and reachable were not matchable. Some people lived close to work and wanted carpool partners who also lived close. Those who lived farther from work were more flexible on proximity, but matches were often not available. Differing work schedules and lack of flextime often precluded matching, even though proximity was good. There were a few instances in which work location was a problem because a small subset of SCG employees works at a building that is about 1 mi from the main building.

The small size of the matching universe proved to be a significant limitation on the matching opportunities available to project registrants. This problem may be avoidable in the future with larger programs. There were other problems, such as people losing interest and people applying only for the prizes, that are not so easily avoidable.

Results of Initial Survey

The initial survey was performed immediately after the matching was completed in September 1983. This survey provided a picture of the registrants' commuting patterns and attitudes at the beginning of the part-time carpooling program. A complete tabulation of the results of this survey is presented in the Appendix. A summary and an interpretation of the salient findings follow (recall that 100 registrants were matched and 112 were not).

- Exactly half of those who were matched commuted less than 10 mi (one way) to work in less than 30 min. The trip lengths of those who were not matched were somewhat longer in both distance and time.

- Only 3 percent of the matched registrants were commuting in a mode other than automobile at the time they registered, whereas 12 percent of the nonmatched registrants were doing so. The latter group included two vanpoolers, one bus rider, and five bicyclists.

- Half of the matched registrants and 60 percent of the nonmatched registrants had had no previous ridesharing experience. This appears to be a surprisingly high percentage, but it might be a result of the twofers program appealing to those whose minds had previously been closed to ridesharing because of perceived inflexibility. The overwhelming majority of those who had had previous ridesharing experience had had positive experiences.

- Of those who had had no previous ridesharing experience who cited a reason for not trying ridesharing, about one-quarter gave reasons that related to flexibility. This appears to conflict with the results of the previous question, and the reason is not clear.

- There was substantial variability in work hours among registrants, and nonmatched people had greater variability than matched people. (This is a cause not an effect.)

- About three-quarters of all registrants can be classified as executive or professional. This was more often the case for the nonmatched than for the matched and is consistent with the prevailing wisdom

among ridesharing practitioners: executive and professional people are less likely to accept ridesharing than are secretarial and clerical staff.

- The nonmatched group is slightly older than the matched group. This may be an effect of job classification rather than a reason for unmatchability.

- An overwhelming majority of all registrants preferred to pool with nonsmokers. There are no similar statistics from the general population, but this appears to be a very high percentage. If this percentage is, indeed, high, it might be a result of the twofer program's appeal to those who wished personalized matching attention, which always includes factors such as smoking preferences.

- An overwhelming majority of both matched and nonmatched registrants said that they were motivated to try the twofer program because they preferred part-time carpooling.

- The paycheck stuffer appears to have been the most effective (most remembered) promotional technique. Perhaps there is some complex psychological explanation for this finding--something to do with positive feelings associated with anything accompanying a paycheck. Another plausible explanation is that people pay more attention to their paycheck than to other things.

RESULTS OF SECOND SURVEY

The second survey was performed in May 1984, approximately 8 months after the matching was completed. The purpose of the second survey was to determine the program participants' long-term commuting patterns and attitudes after the initial effects of the promotion had passed.

A complete tabulation of the results of the second survey is presented in the Appendix. A summary and an interpretation of the major findings are presented here. This survey was directed only to the 100 registrants who were matched, that is, who received names of potential part-time carpool partners. This second survey was performed by telephone during a 4-week period beginning on May 14 by a Hughes Aircraft employee who spent about 55 person-hours telephoning and tabulating data. Of the 100 persons called, 94 were reached and 6 were unreachable. All results pertain to the group of 94 persons who were reached.

- All 94 participants reached remembered the twofer program 8 months after the promotional efforts ended.

- Slightly less than half (44) said they began carpooling as a result of the twofer program, and slightly more than half (50) did not begin carpooling as a result of the program.

- Of the 50 who did not begin carpooling as a result of the program, one-third cited reasons of schedule incompatibility (27 percent) or home location too far away (6 percent). The remaining two-thirds of the 94 people gave a wide variety of reasons that exhibited no discernible patterns.

- Only 16 percent of the 50 noncarpoolers had a negative attitude toward carpooling. This percentage is almost identical to the 18 percent of the 100 matched registrants in the original survey. Although these two groups are not strictly comparable, there is not an obvious change of attitude. (Further analysis of the data could establish comparable groups.)

- Twenty-two percent of the 50 noncarpoolers did not contact their prospective carpool partners.

- Of the 44 people who did begin carpooling as a result of the twofers program, 8 people (18 per-

cent) were still carpooling with their original partner at the 8-month mark and 82 percent were no longer carpooling or were carpooling but not with their original partner. This is a much higher attrition rate than is typical for conventional carpool-matching programs, for which the average duration of a person in a carpool is roughly 2 years (1).

This high attrition rate could be the result of the target market consisting of people whose flexibility needs make them harder to please, or it could simply be because two-person, part-time carpools are inherently less stable than conventional carpool arrangements. It is interesting to note that 89 percent of those who discontinued carpooling had carpooled for less than the promised 3 months.

The attrition rate is of some concern because it indicates that maintenance efforts for part-time carpooling will be considerably greater than for conventional carpool programs. The ongoing maintenance effort would likely include follow-up calls to help resolve carpoolers' problems, to find new partners when a carpool dissolves, and so forth.

- Further examination of the reasons why 36 people discontinued carpooling revealed that almost half (43 percent) stopped carpooling because schedule conflicts arose. Another 45 percent cited external reasons such as "personal problems," "partner quit company," "partner retired," and "partner transferred." Fewer than 12 percent cited reasons that indicated objection to the concept of part-time carpooling (e.g., "inconvenient," "had to wait for another person," "carpooling too restrictive"). This indicates that a strong maintenance effort could have sustained up to 88 percent of the carpools that ended.

- Further examination of attitudes of those who discontinued pooling revealed that 53 percent claimed that they "plan to resume part-time carpooling," and another 14 percent said maybe. This indicated strong approval of the concept and is consistent with the observation that most people discontinued part-time carpooling for reasons that were unrelated to the basic concept.

- Perhaps the most interesting and puzzling finding of this demonstration is that all eight of the persons still carpooling said that they are carpooling 4 or 5 days per week. In dramatic contrast, of those who are no longer carpooling only 28 percent were carpooling 4 or 5 days per week. There is a whole host of possible explanations for this curious result, but they are all speculative.

- The trip length for those eight persons still carpooling was quite long--26 mi average, one way--compared with the 19-mi average trip length of all who were matched. Perhaps the greater costs associated with the longer trip length contribute to carpool longevity. However, the sample of eight poolers is too small to allow firm conclusions to be drawn.

- The great majority of those who began to carpool met their carpool partners each morning at their respective homes.

- The distance between home locations differed dramatically between those still carpooling and those no longer carpooling. More than three-quarters of the latter group were separated by 1 mi or less, whereas only one-quarter of those still carpooling lived within 1 mi of their carpool partner's home. This is exactly the opposite of what would normally be expected.

However, roughly two-thirds of both groups said that they did not have to travel extra mileage for the carpool. Apparently, those who are still carpooling have partners who live along the route to work. This is illogical because more than 90 percent of the carpoolers said they alternated driving, and both carpool partners cannot be along the other's

route to work. Two possible explanations are that most respondents did not perceive less than 3 mi as constituting "extra mileage" or that the farther partner always drove to the meeting point.

- Roughly one-half of all respondents cited some form of cost savings as the major benefit or advantage of part-time carpooling. Other categories of responses (altruism, reduced driving hassle, etc.) were much smaller and without a consistent pattern across the two groups.

- The great majority of both groups said that their feelings about carpooling had not changed as a result of trying the twofers program. Among the relatively small number of people whose feelings did change, there was no clear pattern in the responses to the question "How have your feelings changed?"

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

From the outset, this demonstration project was targeted directly to those commuters who have not been attracted to conventional ridesharing arrangements. These are people with strong needs for commuting flexibility and also, apparently, for personal attention during matching. This group of commuters is normally outside the target market of traditional carpooling programs.

Of the 6,500 persons at the demonstration site who were exposed to some form of promotion, 212 elected to register. Because about 4,400 of those 6,500 were driving alone to work, the 212 applicants represent about 5 percent of the solo drivers at the site. Thus it appears that the typical market size for part-time carpooling is approximately 5 percent of the drive-alone commuters.

On the basis of preliminary evidence, the paycheck stuffer appears to be the most effective promotional technique. This does not imply, however, that other promotional techniques should not be used. It simply means that this is the technique that people most remembered.

There is a strong indication from this demonstration that the 212 registrants were indeed harder to please than the typical carpool program applicant. Their work hours were spread over a wider range compared with those of all employees on site. They exhibited some special needs, such as a very high percentage of nonsmoking preferences. This target market for part-time carpooling appears to contain an abnormally high percentage of "tough cases."

Only 100 of the 212 registrants were matched into potential carpool groupings. Of the 112 who were not, some had no matches available, some had moved or changed job locations, and some had lost interest after registering. Matching proved to be quite difficult because the small size of the data base produced limited matching opportunities.

Of the 100 who were matched, 44 persons actually began carpooling with their designated partner. This represents a placement rate of 21 percent (44/212), which is high compared with traditional carpool programs but in the normal range for personalized matching programs. Given that this market is tougher than the traditional carpool market, this high placement rate is encouraging.

Because of the hard-to-please nature of the commuters in this target market, it appears that personalized matching attention is important to the success of a part-time carpooling promotional effort. It is likely that such a high placement rate would not be achievable without personalized matching.

The high attrition rate (75 percent dropout in 8 months) was disturbing, but it should not come as a

surprise. After all, these are the "tough cases" with special needs for flexibility and social compatibility and with high schedule variability.

The most curious conclusion, however, was that all eight of the persons remaining in carpools at the end of the project were carpooling 4 or 5 days per week. Strong conclusions should not be drawn from this because only four carpools are represented and this is a statistically unreliable sample. Even so, it appears that there is something to be learned from the fact that there were no 2-day carpools in operation at the end of the demonstration. Many explanations are possible, of course. One explanation is that, when their needs for personal attention and flexible arrangements are met, these particular commuters find that their commuting patterns are rather stable after all. Perhaps it is all a matter of perception.

Recommendations

Based on the results of this demonstration, it can be said that the part-time carpooling concept is a viable means of reaching a new segment of the solo-driver commuting market that is not generally reached by traditional carpooling programs.

Much was learned from this first effort at promoting this new concept. The results were encouraging enough to suggest that the project should be replicated elsewhere, with improvements based on what was learned from this demonstration. Several suggestions for such future efforts follow.

1. The special needs of this market segment indicate a clear need for personalized matching procedures. These procedures are much more labor intensive than the conventional matching process (distribution of printed match lists), but this higher level of investment appears to produce a higher placement rate. Future projects of this type, which may not have the unavoidable inefficiencies of a demonstration project, should attempt to measure the extent to which the higher placement rate justifies the higher level of investment in matching.

2. The high attrition rate demonstrates clearly that a part-time carpooling project will require a strong, ongoing maintenance effort to keep the carpools operating. (This type of maintenance effort would typically include follow-up calls to help resolve carpool problems and to help find new partners when carpools break up.) Such a maintenance effort was not part of this demonstration, and the effects are clear.

3. Future projects should try to screen out cheaters. Although this was not a big problem, there were a small number of people who were attracted by the prizes and registered even though they were already carpooling or were not really interested. The ground rules should be made clear to all registrants.

4. Future part-time carpooling efforts should attempt to operate on a larger scale to produce a larger base of registrants. The 212 registrants in this demonstration produced very limited matching opportunities, which made matching very difficult and left a sizable number of interested registrants with no available matches.

In summary, part-time carpooling is a promising technique for reaching beyond the commuter market segments traditionally served by conventional ridesharing programs. This market segment has unique needs, and the per capita level of effort required to satisfy this market segment is relatively high. However, as ridesharing programs begin to saturate their traditional market segments--as some already have--the part-time carpooling concept holds promise

as a way of expanding into a new market and continuing to increase the effectiveness of ridesharing programs.

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The Space and Communications Group of Hughes Aircraft Company served as the demonstration site. Carol Gerard, Commuter Services Administrator for SCG, was in charge of all ridesharing activities including all project activities. Trish Rundie, of the SCG Presentation and Graphics Department, assisted with development of printed materials.

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APPENDIX

Initial Matching Survey Statistics

TABLE 1 Distance from Home to Work (one way)

Distance (mi)	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Less than 5	8	8.0	5	4.5	13	6.1
5-9	42	42.0	32	28.6	74	34.9
10-19	28	28.0	35	31.2	63	29.7
20-29	13	13.0	20	17.9	33	15.6
30-39	3	3.0	12	10.7	15	7.1
40 and more	6	6.0	8	7.1	14	6.6
Total	100	100.0	112	100.0	212	100.0

TABLE 2 Time to Commute (one way)

Minutes	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Less than 10	7	7.0	0	0.0	7	3.3
10-19	9	9.0	8	7.1	17	8.0
20-29	34	34.0	27	24.1	61	28.8
30-44	23	23.0	37	33.1	60	28.3
45-59	15	15.0	22	19.6	37	17.5
60 or more	12	12.0	18	16.1	30	14.1
Total	100	100.0	112	100.0	212	100.0

TABLE 3 Current Mode of Commute

	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Automobile	97	97.0	99	88.4	196	92.4
Bicycle	1	1.0	5	4.5	6	2.8
Bus	1	1.0	1	0.9	2	1.0
Motorcycle	1	1.0	3	2.6	4	1.9
Truck	—	—	2	1.8	2	1.0
Vanpool	—	—	2	1.8	2	1.0
Total	100	100.0	112	100.0	212	100.0

TABLE 4 Previous Positive or Negative Ridesharing Experience

	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Yes						
Positive	41	82.0	46	88.5	87	85.3
Negative	9	18.0	6	11.5	15	14.7
Subtotal	50	50.0	52	46.4	102	48.1
No	50	50.0	60	53.6	110	51.9
Total	100	100.0	112	100.0	212	100.0

TABLE 5 Reasons for Not Having Tried Ridesharing

	No. Matched	No. Nonmatched	Total
Unable to commit to 5 days	3	0	3
Children to school or sitter	1	0	1
Work schedule inflexible	1	6	7
Frequent company business	2	0	2
Required meeting attendance	0	1	1
Frequent overtime	0	1	1
Attends school	1	0	1
Lack of interest	4	3	7
Small car	1	0	1
Carpooling inconvenient	0	3	3
Prefer to drive self	4	1	5
Needs car for job	0	1	1
Has car problems	0	1	1
Likes having car handy	0	1	1
Short distance from home	5	2	7
New to company	7	2	9
Unable to find match	5	7	12
Not interested in 5-day carpool	1	0	1
Total	35	29	64

TABLE 6 Scheduled Hours of Work

Hours	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
a.m. to p.m.						
6:00-3:00	2	2.0	3	2.7	5	2.4
6:30-3:00	—	—	5	4.5	5	2.4
6:45-3:15	—	—	8	7.1	8	3.8
7:00-3:30	—	—	2	1.8	2	0.9
7:00-4:00	18	18.0	23	20.5	41	19.3
7:00-6:00	—	—	2	1.8	2	0.9
7:30-4:30	6	6.0	10	8.9	16	7.5
7:45-4:45	2	2.0	—	—	2	0.9
8:00-5:00	26	26.0	14	12.5	40	18.9
8:15-12:15	—	—	1	0.9	1	0.5
8:15-5:15	36	36.0	26	23.2	62	29.3
8:30-5:30	8	8.0	9	8.1	17	8.0
9:00-6:00	2	2.0	8	7.1	10	4.7
p.m. to a.m.						
3:30-12:00	—	—	1	0.9	1	0.5
Total	100	100.0	112	100.0	212	100.0

TABLE 7 Job Title

	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Management/administration	34	34.0	40	35.7	74	34.9
Professional/degreeed	26	26.0	39	34.8	65	30.7
Technical	12	12.0	20	17.9	32	15.1
Secretarial/clerical	14	14.0	4	3.6	18	8.5
Production	0	0.0	9	8.0	9	4.2
Unknown	14	14.0	0	0.0	14	6.6
Total	100	100.0	112	100.0	212	100.0

TABLE 8 Age of Respondents

Years	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Under 20	0	0.0	0	0.0	0	0.0
20-29	29	29.0	23	20.5	52	24.5
30-39	12	12.0	21	18.8	33	15.6
40-49	21	21.0	36	32.1	57	26.9
50 or more	15	15.0	32	28.6	47	22.2
Unknown	23	23.0	0	0.0	23	10.8
Total	100	100.0	112	100.0	212	100.0

TABLE 9 Sex of Respondents

	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Female	43	43.0	38	33.9	81	38.2
Male	57	57.0	74	66.1	131	61.8
Total	100	100.0	112	100.0	212	100.0

TABLE 10 Smoking Preference

	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Smoker	17	17.0	19	17.0	36	17.0
Nonsmoker	83	83.0	93	83.0	176	83.0
Total	100	100.0	112	100.0	212	100.0

TABLE 11 Motivation for Participation

	No. Matched	No. Nonmatched	Total
Prefer 2 days	42	51	93
More flexible	2	0	2
Not locked into 5 days	0	2	2
Two days will fit schedule	1	4	5
Vanpool not as flexible	1	0	1
Works overtime	0	1	1
Works unusual hours	0	2	2
Unable to find 5-day carpool	0	1	1
Cost saving	6	6	12
Free lunch	1	0	1
Save company parking	0	1	1
Everyone else is doing it	1	0	1
Ecological	2	1	3
New idea, willing to try	2	0	2
Management asked them to	0	3	3
Liked advertising	1	4	5
Saw notice	6	0	6
Will reduce traffic	2	0	2

TABLE 12 Reasons for Willingness To Try Carpooling Now

	No. Matched	No. Nonmatched	Total
Just moved	1	0	1
New to company	2	0	2
Lost carpool partner	2	0	2
Never had opportunity	0	2	2
Look into any type of carpooling	0	4	4
No luck trying to find carpool	0	2	2
Tired of driving	1	0	1
Believes in carpooling	2	3	5
Twofer allows freedom	1	1	2
Will allow for school	3	5	8
Hoping it will lead to 5 days	1	3	4
Goes to doctor 1 day/week	0	1	1
In carpool, looking for more riders	0	1	1
Has car problems	3	0	3
Doesn't like to ride bus	1	0	1
Husband retired, now needs ride	1	0	1

TABLE 13 Best Marketing Strategies

	Matched		Nonmatched		Total	
	No.	%	No.	%	No.	%
Teaser poster 1	26	17.6	46	19.7	72	18.9
Teaser poster 2	21	14.2	36	15.5	57	15.0
Announcement poster	13	8.8	22	9.4	35	9.1
Paycheck stuffer	68	45.9	89	38.2	157	41.2
Company newspaper article	6	4.0	16	6.9	22	5.8
Other flyer ^a	13	8.8	24	10.3	37	9.7
Orientation package ^b	1	0.7	0	0.0	1	0.3
Total ^c	148	100.0	233	100.0	381	100.0

^aNo flyer was included in the promotional material to be posted or distributed.

^bThe orientation package given to new hires did not include any twofer promotion material; it contained only general commuter services information.

^cDoes not match total of study participants because some individuals gave more than one response.

Follow-Up Survey Statistics

TABLE 14 People Not Contacted

Reason	No.
Left company	3
On vacation	2
Died	1
Total	6

TABLE 15 Answers to "Do You Recall the Twofers Program?"

	No.	%
Yes	94	94.0
No	0	0.0
Other (unable to contact)	6	6.0
Total	100	100.0

TABLE 16 Answers to "Did You Begin Carpooling as a Result of the Twofers Program?"

	No.	%
Yes	44	44.0
No	50	50.0
Other (unable to contact)	6	6.0
Total	100	100.0

TABLE 17 Reasons for Not Participating

	No.	%
Partner terminally ill	1	1.7
Never got in touch with partner	4	6.7
Unable to contact partner—bad telephone	1	1.7
Decided that hours not similar enough	16	27.0
Set up carpool only for emergency purposes	3	5.1
Wanted to drive alone	3	5.1
Wanted to have a car at noon	1	1.7
Partner lived too far out of the way	4	6.7
Take kids to school in morning	2	3.4
Ride bike to work	1	1.7
Frequently changed work locations	1	1.7
Jury duty	2	3.4
Wanted to ride more times per week	2	3.4
Was attending school	2	3.4
Partner not interested	3	5.1
Didn't live far enough away from work	2	3.4
Carpooled with someone else	2	3.4
Always had to drive	2	3.4
Never heard about it	1	1.7
Never set it up	2	3.4
Wife or husband was jealous	2	3.4
Moved	1	1.7
"I don't remember"	1	1.7
Total	59 ^a	100.0

^aDoes not equal total of study participants because some individuals gave more than one response.

TABLE 18 Attitude Toward Carpooling of Those Not Participating

	No.	%
Positive	30	60.0
Undecided	12	24.0
Negative	8	16.0
Total	50	100.0

TABLE 19 How Partners of Those Not Participating Were Contacted

	No.	%
By telephone	19	38.0
In person	7	14.0
Unknown	13	26.0
Was not contacted	11	22.0
Total	50	100.0

TABLE 20 Answers to "Are You Still Carpooling?"

	No.	%
Yes	8	18.0
No	36	82.0
Total	44	100.0

TABLE 21 Answers to "Are or Were There Any Additional People in the Carpool?"

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Yes	2 ^a	5.6	2 ^a	25.0
No	34	94.4	6	75.0
Total	36	100.0	8	100.0

^aOne additional person per carpool.

TABLE 22 Answers to "How Long Did You Carpool or Have You Carpooled?"

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
1 week or less	3	8.3	0	0.0
> 1 week but < 1 month	9	25.0	0	0.0
1 month to < 3 months	13	36.1	0	0.0
3 months to < 6 months	8	2.3	0	0.0
6 to 9 months	3	8.3	8	100.0
Total	36	100.0	8	100.0

TABLE 23 Reasons That Carpools Ended

	No.	%
Personal problems	1	2.4
Found a more suitable partner	1	2.4
Partner just quit	3	7.1
Inconvenient	2	4.7
Schedule conflict arose	18	43.0
Not saving enough mileage to justify the hassles	2	4.7
Had to wait for another person	1	2.4
Partner retired	1	2.4
Started school	3	7.1
Didn't feel comfortable with partner's driving	1	2.4
Moved	3	7.1
Used more gas taking partner's children to school	1	2.4
Partner's vehicle unsafe	1	2.4
Partner left company	1	2.4
Decided that carpooling was too restrictive	1	2.4
Partner transferred work location	2	4.7
Total	42 ^a	100.0

^aDoes not equal number of participants because some individuals gave more than one response.

TABLE 24 Answers to "Do You Plan to Resume Part-Time Carpooling?"

	No.	%
Yes	19	52.8
No	12	33.3
Possibly	3	8.3
If the situation is right	2	5.6
Total	36	100.0

TABLE 25 Answers to "How Many Days a Week Are or Were You Carpooling?"

Days	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
1	0	0.0	0	0.0
2	15	41.7	0	0.0
3	11	30.5	0	0.0
4	8	22.2	4	50.0
5	2	5.6	4	50.0
Total	36	100.0	8	100.0

TABLE 26 Answers to "Where Did or Do You Meet Your Partner?"

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Respective homes	28	77.8	8	100.0
Street corner near respective homes	8	22.2	0	0.0
Total	36	100.0	8	100.0

TABLE 27 Distance Between Home Locations

Miles	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Less than 1/2	17	47.2	2	25.0
1/2 to 1	11	30.6	0	0.0
> 1 to 3	7	19.4	4	50.0
> 3 to 5	1	2.8	2	25.0
More than 5	0	0.0	0	0.0
Total	36	100.0	8	100.0

TABLE 28 Answers to "Do or Did You Have To Travel Extra Mileage for the Carpool?"

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Yes	9	25.0	3	37.5
No	27	75.0	5	62.5
Total	36	100.0	8	100.0

TABLE 29 Extra Miles Traveled in Carpool

Miles	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Less than 2	4	44.5	1	33.3
2 to < 4	2	22.2	0	0.0
4 to < 6	2	22.2	2	66.7
6 or more	1	11.1	0	0.0
Total	9	100.0	3	100.0

TABLE 30 How Driving Is or Was Shared

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Alternate days	18	50.0	6	75.0
Alternate weeks	15	41.7	2	25.0
One driver	3 ^a	8.3	0	0.0
Total	36	100.0	8	100.0

^aNo money was exchanged.

TABLE 31 Perceived Advantages to Part-Time Carpooling

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
None	10	16.1	0	0.0
Save on gas	13	21.1	0	0.0
Save on wear and tear on car	7	11.3	1	6.7
Conservation	4	6.5	1	6.7
Not having to drive	5	8.1	3	20.0
Save money	1	1.6	0	0.0
Learned ways to get home faster	2	3.2	0	0.0
Cuts down on traffic	1	1.6	0	0.0
Allows flexibility for overtime	1	1.6	0	0.0
Didn't have car; provided transportation	1	1.6	0	0.0
Fewer parking hassles	2	3.2	1	6.7
Keeps one on schedule	1	1.6	1	6.7
More relaxed due to not having to drive	1	1.6	0	0.0
Saves time	2	3.2	0	0.0
Frees car for my family	1	1.6	1	6.7
Conversation	10	16.0	1	6.7
Economics	0	0.0	6	40.0
Total	62 ^a	100.0	15 ^a	100.2 ^b

^aDoes not equal number of participants because some individuals gave more than one response.

^bTotal is greater than 100% because of rounding.

TABLE 32 Answers to "Have Your Feelings Toward Carpooling Changed Because of This Program?"

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
No	27	75.0	7	87.5
Yes	9	25.0	1	12.5
Total	36	100.0	8	100.0

TABLE 33 Reasons for Negative Responses in Table 32

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
It works out well with three people	0	0.0	1	12.5
Have always been positive about it	7	22.5	6	75.0
Carpooled before and liked it	0	0.0	1	12.5
Save gas, time, and money	3	9.7	0	0.0
Good to share company	1	3.2	0	0.0
I like to do it	0	0.0	0	0.0
Good in right situation, otherwise it is a hassle	1	3.2	0	0.0
If one lives close to work, there are inconveniences	2	6.5		
Twofer was a catalyst	1	3.2	0	0.0
Like it if it is flexible	1	3.2	0	0.0
Great if it fits your lifestyle	1	3.2	0	0.0
Gives one a chance to rest	1	3.2	0	0.0
Good idea	3	9.7	0	0.0
Favor it	2	6.5	0	0.0
If situation were different would do it	2	6.5	0	0.0
Partner must be able to handle it	1	3.2	0	0.0
Pain but worth it if live far away	2	6.5	0	0.0
Good because there is too much traffic	1	3.2	0	0.0
Have to make a commitment	1	3.2	0	0.0
Conservation	1	3.2	0	0.0
Total	31 ^a	100.0	8 ^a	100.0

^aTotal does not equal number of negative responses in Table 32 because some people gave more than one answer.

TABLE 34 Reasons for Affirmative Answers in Table 32

	Not Still Carpooling		Still Carpooling	
	No.	%	No.	%
Would not carpool if had a second car	0	0.0	1	50.0
Would not carpool if it were not economically advantageous	0	0.0	1	50.0
Thought there would be problems, but it is easier	1	5.6	0	0.0
Feel positive	2	11.1	0	0.0
Didn't like bus, but like carpooling	1	5.6	0	0.0
Skeptical at first, but like it now	3	16.7	0	0.0
Look at it more realistically now	2	11.1	0	0.0
Now know what it is all about	2	11.1	0	0.0
Stopped feeling guilty for not carpooling	1	5.6	0	0.0
More pro carpooling, before wouldn't even consider it	1	5.6	0	0.0
Saves money	1	5.6	0	0.0
Helps cut down traffic	1	5.6	0	0.0
It is bad if one has an irregular schedule	1	5.6	0	0.0
It is convenient	1	5.6	0	0.0
It helps save time	1	5.6	0	0.0
Total	18 ^a	100.4 ^b	2 ^a	100.0

^aTotal does not equal number of affirmative responses in Table 32 because some people gave more than one answer.

^bTotal is not 100% because of rounding.

TABLE 35 Original Commuting Mode (information obtained from first survey)

Mode	Not Con- tacted		Nonparti- cipant		Still Car- pooling		Not Still Carpooling	
	No.	%	No.	%	No.	%	No.	%
Bus	0	0.0	0	0.0	0	0.0	1	2.8
Motorcycle	0	0.0	0	0.0	0	0.0	1	2.8
Bicycle	0	0.0	1	2.0	0	0.0	0	0.0
Commuter van	0	0.0	0	0.0	0	0.0	0	0.0
Truck	0	0.0	0	0.0	0	0.0	0	0.0
Auto- mobile	6	100.0	49	98.0	8	100.0	34	94.4
Total	6	100.0	50	100.0	8	100.0	36	100.0

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Survey and Analysis of Vanpooling in Metropolitan Washington, D.C.

JON WILLIAMS

ABSTRACT

It is difficult to use traffic-counting programs in Washington, D.C., to accurately monitor vanpool occupancies because of the high speeds, high occupancies, and vision-restricting "privacy windows" of vans. A survey of vanpool operators was conducted to develop occupancy factors for traffic monitoring and also to collect other data of general interest. Because many of the vanpools in the Washington area are owner operated, a comprehensive survey of the entire population was not feasible through employers or third-party providers. Thus a license-plate survey technique was developed; it led to a mail-back survey that had a 57 percent response. A sample of the nonrespondents was contacted by telephone to correct for bias. Survey findings cover the following topics: number of vanpools, origins and destinations, occupancy rates, travel times and trip lengths, traffic assignment, collection-distribution characteristics, vehicle ownership, preferential treatment and parking, assistance from ridesharing agencies, and operators' concerns.

In the Spring of 1982 the Metropolitan Washington Council of Governments (COG) undertook a mail-back and telephone survey of operators of vanpools that had been spotted on major arterials in the morning peak period. The survey was conducted to develop average vanpool occupancy factors to be used in traffic volume and occupancy studies that are conducted by COG. Accurate monitoring of vanpools and their occupants is an important concern in the Washington, D.C., area because public agencies have implemented policies to encourage high-occupancy vehicle use in commuting, including restriction of certain highway lanes to carpools, vanpools, and buses. The immediate reason for the survey was the

apparent rapid growth in vanpooling, coupled with difficulties in monitoring that result from high speeds, high occupancies, and dark passenger "privacy windows" of vans.

To perform such a survey and produce representative occupancy data, it was necessary to develop a method of sampling the total vanpool population. Many of the Washington, D.C., region's vanpools are known to be privately owned and operated, and these could not be located through employers or third-party vanpool providers. Thus the survey technique selected was license-plate monitoring in traffic, which led to a mail-back survey of vanpool operators. Because mail-back surveys are sometimes associated with nonrespondent bias, a telephone survey of a sample of the mail-back nonrespondents was also planned.

Although vehicle occupancies and traffic-count factors were the first concern of the study, it was