Parking Cost and Mode Choices Among Downtown Workers: A Case Study

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Two downtown companies were compared in an effort to clarify the relationship between mode choice in the journey to work and employers' policies regarding the subsidization of their workers' parking costs. The two firms were located at the same site, and their employees had access to the same parking facilities. One company provided a partial parking subsidy to about one-third of its employees and no financial assistance to ridesharers or those who commuted by transit. The other firm had a more complex system of subsidies to its employees, providing varying levels of support for solo drivers, carpoolers, vanpoolers, and transit riders. Despite the differences in their commuter subsidy programs, the proportion of employees commuting to work by solo driving was about the same in the two companies. The elaborate subsidy program of the second company resulted primarily in a shift of commuters from transit to carpooling and vanpooling. The second company also spent a great deal more money than the first on the promotion of ridesharing, yet the bulk of its commuter subsidy was expended on paying the parking costs of solo drivers. This countered the effectiveness of its efforts to promote ridesharing and transit use. These findings add to the growing body of literature that shows that it is more cost-effective to promote ridesharing and transit use by eliminating parking subsidies to solo drivers than it is to offer additional subsidies to transit users and ridesharers in a firm that already subsidizes the parking of solo drivers.

A growing body of evidence shows that the availability of inexpensive parking is the most important inducement to commuting by singly occupied automobile. Conversely, higher-priced parking encourages the use of high-occupancy vehicles. This is especially true in downtown areas where parking costs tend to be highest, and where public transit and ridesharing programs are most likely to be available. Subsidizing employee parking lowers vehicle occupancies; reduces the use of transit, carpools, and vanpools; and thus increases congestion and delay in the journey to work. In many cases, companies spend a great deal of money promoting ridesharing among their workers, at the same time discouraging ridesharing by offering them free or reduced-rate parking.

W. E. Francis and C. L. Groning (*The Effects of Subsidization of Employee Parking on Human Behavior*, unpublished research paper, University of California, 1969) studied the mode of travel to work among 275 downtown employees in Los Angeles in 1969. The workers in their sample were about evenly divided among federal employees who paid to park at work and county employees who were given free parking. The samples were similar in composition in gender, skill level, and income. More than 72 percent of those receiving free parking at work drove downtown in singly occupied automobiles, while only 40 percent of those who had to pay for parking drove alone.

In Ottawa, the Canadian government discontinued the provision of free parking to federal civil servants in 1975 and began charging employees 70 percent of commercial parking fees. Even in that transit-oriented city, where more than 40 percent of the workforce used transit to get to work when parking was free, the proportion of government employees driving to work alone dropped from 35 percent to 27 percent within a few months of the imposition of a charge for parking *(1)*.

In Century City, a major office and shopping complex in Los Angeles, Shoup and Pickrell *(2)* studied travel modes among workers who had to pay the full cost of parking, those whose parking cost was partially subsidized by their employers, and those who parked free because employers fully subsidized their parking. Among workers whose parking was free, 92 perent drove to work alone; 85 percent of those whose parking was partly subsidized commuted in singly occupied automobiles; and only 75 percent of those who bore the full cost of parking commuted to work as solo drivers.

In another study of the employees of a regional ridesharing agency, Surber, Shoup, and Wachs *(3)* found that 42 percent of the employees drove to work alone when the company paid the monthly parking fee of $57.50; but when the company ended the practice of paying for parking at work, the proportion of their workers driving alone dropped to 8 percent. When free parking was available, average automobile occupancy among those who commuted by car was 1.2, and after free parking was eliminated automobile occupancy among those who came to work by car had risen to 1.8.

This evidence indicates that successful promotion of ridesharing and transit use among employees is critically dependent on policies that affect the price of parking. The most important way in which employers influence the price of workers' parking is through subsidizing them by paying part of all of their costs of parking at work. Further testing of the

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TABLE 1 BUILDING AND PARKING CHARACTERISTICS

	Company A	Company B
Floor Area Occupied	648,000 sq.ft.	1,080,000 sq.ft.
Percent of Building Occupied	54%	90%
Number of Employees, Jan. 1986	2,045	1,200
Parking Spaces Leased by Company	508	710

significance of parking subsidies on mode choice for the commute to work was pursued by finding two large downtown employers having similar workforces and location but differing in their policies regarding parking and ridesharing promotion for their workers. In this paper, the results of a comparison of two companies in downtown Los Angeles are presented, and the expectation that the companies' parking subsidy policies are critical determinants of the mode choice of their employees is confirmed. Further research would be required to determine whether similar results would be obtained in studies of outlying suburban worksites.

THE COMPANIES AND THEIR POLICIES

The two companies selected for analysis were the major occupants of identical 52-story office towers in downtown Los Angeles. The two office towers were built over a shared subterranean parking facilitiy in which spaces were available for lease on a monthly basis, and in which daily parking was also available. Another multilevel parking structure across the street also served employees of the twin towers. The site was also well served by public transit routes to all parts of the region. Because parking spaces and transit services were available to employees at the market price when they didn't receive subsidies from their employers, price, rather than limitations on supply, could be isolated as the policy variable most easily controlled by the employers.

As presented in Table 1, Company A occupied 54 percent of the floor area in one of the office towers where it employed 2,045 workers. It had no organized ridesharing program, but leased 508 parking spaces for its employees at a cost of $100.00 per month, and made them available to employees at $60.00 per month. The company thus offered a subsidy of $40.00 per month to its employees who parked in these 508 spaces, and a waiting list existed for employees who wished to receive a subsidized space. Employees who did not receive one of the subsidized spaces had to pay the full market rate for parking at this site, had to park at more remote but lower-cost locations, or had to use an alternative mode of travel for the journey to work.

As shown in Table 1, Company B occupied 90 percent of the other office tower, and at the time of the investigation had 1,200 employees at this downtown site. This company was nationally recognized as a leader in the promotion of ridesharing among its employees, and while it leased 710 parking spaces for its employees, it also actively promoted carpooling, vanpooling, and transit use. Table 2 presents the way in which Company B attempted to promote the use of high-occupancy vehicles through a policy of subsidizing commuting by various modes. A solo driver could park in one of the company's leased spaces for half the commercial price, thus receiving a subsidy of $50.00 per month. A carpool of two people received a parking subsidy of $75.00 per month, and a carpool of three or more people received free parking, a subsidy having a cash value of $100.00 per month. An employee who rode in a 10-person vanpool received a subsidy of $25.00 per month toward parking and operating costs; and an employee who used public transit received a company contribution of $15.00 per month toward travel costs. As presented in Table 2, Company B generally increased its subsidy per vehicle as vehicle occupancy increased. The policy, however, provided the largest subsidy per worker to those who drove to work in singly occupied automobiles, while the lowest subsidy per employee was given to those using public transit.

SURVEY EMPLOYEES

A short written survey instrument was designed to collect information on the characteristics of a sample of employees in

TABLE 2 COMMUTING SUBSIDY PROGRAM OF COMPANY B

Travel Mode	Subsidy Per Vehicle	Subsidy Per Employee
Solo Drivers	$50.00	$50.00
Carpools of Two	$75.00	$37.50
Carpools of Three	$100.00	$33.33
Vanpools	$250.00*	$25.00
Public Transit	---	$15.00

*The total subsidy for a van is $250.00 which consists of a $100.00 parking subsidy and $15.00 travel allowance for an average of ten employees in a van.

TABLE 3 COMMUTING MODES

Mode	Company A	Company B
Drive alone	49%	48%
Car/Vanpool	20%	34%
Transit (Bus)	31%	18%
	100%	100%
	N = 108	N = 62

Note: Company A has no ridesharing program and spends less on parking subsidies; Company B has a ridesharing program and spends more on parking subsidies.

each company, and their journeys to work. Three departments from each company were selected at random from a listing of all departments, and questionnaires were distributed to every employee in the chosen departments. In Company B, the ridesharing coordinator distributed the questionnaires and collected them a day later. Company A had no ridesharing coordinator, and the heads of the selected departments distributed the questionnaires and collected them the next day. The response rate was nearly 100 percent in both companies, resulting in a sample of 108 employees or 5.3 percent of the workforce of Company A and of 62 employees or 5.1 percent of the workforce of Company B.

The most important results of the survey are presented in Table 3, which summarizes the mode of travel to work of the employees of the two companies. About an equal proportion of the workers of the two companies drove to work alone—just under half for each company. Thus, although Company B had a program for encouraging ridesharing, and Company A had none, both companies achieved approximately the same level of commuting by high-occupancy vehicles. The organized ridesharing program at Company B resulted in much greater use of carpooling and vanpooling than in Company A, but at the expense of much lower transit use instead of solo driving. Although 34 percent of the employees of Company B chose to commute by carpools and vanpools and only 18 percent used the bus, in Company A only 20 percent used carpools and vanpools and 31 percent used the bus.

A number of cross tabulations and chi-square tests showed no significant associations between social and demographic characteristics of the companies' workforces and their distribution of mode choices. For example, there was great similarity in the travel distances between home and work for the workforces of the two companies (Table 4). The need for a car at work, job classification (professional versus clerical), availability of market-rate parking, and length of journey to work did not differ in any significant way. The differences in mode choice among the workers of the two companies resulted primarily from differences in parking costs that resulted from different subsidy policies.

COST-EFFECTIVENESS OF EMPLOYEE COMMUTE SUBSIDY PROGRAMS

Assuming that the samples of employees of the two companies were equally representative of their workforces, and using transportation program costs to the two companies provided in five extended interviews with company officials, the costs of the transportation subsidy programs were compared with their effects on mode choice.

TABLE 4 WORK TRIP LENGTHS

Travel Distance (miles)	Company A	Company B
1-12	35%	36%
12-23	42%	40%
23-34	13%	18%
34-52	10%	10%
TOTAL	100%	100%
	N = 108	N = 62

TABLE 5 MONTHLY COSTS OF TRANSPORTATION PROGRAM AT COMPANY B

Parking Subsidy and Travel Allowance by Mode	Company Cost per Employee	Number of Employees in Each Mode	Total Cost
Parking Subsidy for Solo Drivers	$50.00	576	$28,800
Parking Subsidy for Carpools of Two	$37.50	72	$ 2,700
Parking Subsidy for Carpools of Three	$33.33	132	$ 4,400
Parking Subsidy and Travel Allowance for Vanpools	$25.00	192	$ 4,800
Travel Allowance for Public Transit Users	$15.00	216	$ 3,240
Administrative Cost	$ 7.00	(1,200)	$ 8,400
		TOTAL	$52,340

Company A was the simpler case. The company subsidized its employees' journeys to work only by covering $40.00 of the monthly cost of parking for holders of the 508 spaces it leased. Employees not parking in these spaces, including those parking elsewhere and those using vanpools or transit, received no subsidy. The total cost to the company was, therefore, $20,320 per month. Because the company had 2,045 employees, its cost was $9.94 per month per employee.

The cost of commuting to work was subsidized to a far greater extent in the case of Company B, but the costs of the subsidy program were more complex in that they differed with the mode chosen and the occupancy of the vehicles used. The cost to the company of the subsidy program is presented in Table 5. The total subsidy, which appears at the bottom of the right-hand column in Table 5, was $52,340 per month. The total included an estimate of administrative costs of the promotion of ridesharing, such as printing promotional materials and the salaries of several staff members who were designated ridesharing coordinators. Because Company B had 1,200 employees at this site, the monthly cost averaged $43.62 per employee.

Table 6 presents the distribution of monthly subsidy at Company B by travel mode. Company B subsidized its ridesharing program with the stated purpose of reducing commuting by solo driving and encouraging commuting by carpooling, vanpooling, and public transit. Although it spent $33.68 more each month per employee more than Company A, it achieved the same level of commuting by solo driving. Its substantial marginal expenditure achieved the result of increasing vanpooling and carpooling rates at the expense of public transit use. This result is inconsistent with the company's purposes in adopting its high profile as an aggressive promoter of ridesharing.

Unless the purpose of Company B's programs was to divert commuters from public transit into carpools and vanpools without reducing solo driving, why should it have spent $44 per month per employee to achieve this result? After all, the diversion of commuters from transit to carpools and vanpools actually increased the number of vehicles driven to work, a result

TABLE 6 MONTHLY SUBSIDY FOR EACH TRAVEL MODE AT COMPANY B

Mode Split	Employees		Subsidy	
	Number	Percent*	Dollar/Mo.	Percent
Solo Drivers	576	48%	28,800	65%
Carpools of Two	72	6%	2,700	6%
Carpools of Three	132	11%	4,400	10%
Vanpools	192	16%	4,800	11%
Transit	216	18%	3,240	7%
TOTAL	1,188	99%	43,940	99%

*The percentages do not add up to one hundred because of rounding.

surely counter to the intent of a ridesharing program. Because a program of eliminating all subsidies for any mode of travel would reduce solo driving and increase transit use, it is puzzling to find that a company strongly committed to promoting ridesharing spent so much on a program that actually increased the number of vehicles driven to its work site.

One explanation for Company B's behavior is that the effect on commuting behavior was not the only result of the ridesharing program. Another effect was to provide a tax-exempt fringe benefit for all employees. Company B's commuting subsidy program transferred $50.00 per month in parking subsidy to each solo driver and lesser amounts to employees who choose other travel modes (Table 2). Because parking subsidies were tax-exempt fringe benefits, it is clearly more advantageous to have paid employees in the form of a parking subsidy than to pay them in cash, and the $15.00 per month in a subsidy to transit users is undoubtedly determined by the federal income tax code, which sets this as the maximum tax-free transit subsidy that an employer can offer an employee. Given the tax-exempt status of the parking subsidy, it was clearly difficult for an employer to forgo offering this fringe benefit, even if it worked counter to the desire of promoting ridesharing *(4)*.

It would be improper to conclude from this analysis that ridesharing programs cannot work. Rather, the program enthusiastically promoted by Company B is imperfectly designed and could be substantially improved. The greatest difference between Companies A and B was not in the extent to which Company B spent money on its employee commute program, but in the extent to which its program favored solo drivers despite its stated intention of promoting ridesharing. Table 6 presents the distribution of the total expenditure of Company B on employee commuting, and indicates that 65 percent of the total cost was spent in direct subsidies to the 48 percent of its employees who were solo drivers. In fact, company B spent $8,000 more each month subsidiing its solo drivers than did Company A, despite the fact that Company A had nearly twice the number of employees. Thus, while adopting a public image of aggressive promotion of ridesharing, Company B was less effective at the promotion of ridesharing than it would have been if it were not also heavily subsidizing solo driving through the expenditure of most of its parking subsidy. Lowering subsidies to solo drivers could reduce the cost of the company's ridesharing program by more than half while increasing the proportion of employees using high-occupancy vehicles. Any company that wishes to maintain its current commuter subsidy expenditure, while substantially increasing its employees' use of transit, carpooling, and vanpooling, should consider reducing the subsidy for solo drivers while increasing its subsidy to transit, vanpool, and carpool users.

ACKNOWLEDGMENT

The authors gratefully acknowledge important contributions made to this study by Ned Levine, a member of the Faculty of Urban Planning at UCLA. They also extend appreciation to the employees of the two companies who gave of their time to complete the questionnaires and to meet with them.

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