Effects of Ending Employer-Paid Parking for Solo Drivers

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ABSTRACT

The change in employee travel choices at a company in Los Angeles that ended employer-paid parking for solo drivers who do not use their cars at work is documented. The modal split among affected employees changed in the following ways: solo driving fell from 42 to 8 percent, carpooling rose from 17 to 58 percent; and bus ridership declined from 38 to 28 percent. There was no change in the modal split at a nearby comparison company that continued to offer free parking to all employees. It is concluded that ending employer-paid parking for solo drivers significantly influenced employees' modal choices.

Commuter Transportation Services, known popularly as Commuter Computer, was founded in 1974 as a private nonprofit corporation to promote ridesharing in southern California, and since that time its transportation subsidy policy has evolved toward consistency with its mission. In 1974 all employees were offered free parking as a fringe benefit. In 1976 each vanpooler was offered a subsidy equal to the price of a parking space. In 1979 bus riders were offered free transit passes. And in 1981 there was a decision at Commuter Computer to phase out parking subsidies for the 70 percent of employees who did not use their cars for work. Carpoolers continued to park free, and the transit pass program was unaltered.

Commuter Computer is located on Wilshire Boulevard, a central transit corridor near the Los Angeles central business district (CBD). Until May 1982 Commuter Computer paid $57.50 a month per space to rent parking spaces that it offered free to its employees, so the parking subsidy for each solo driver was $57.50 a month. This subsidy was eliminated in two phases. Beginning in May 1982, the parking subsidy for solo drivers was reduced to $28.75 a month. Those people who continued to park in the building paid $28.75 per month for a space that cost Commuter Computer $57.50 a month, and those who continued to drive alone and park elsewhere were reimbursed for half their cost of parking, up to $28.75 per month. In May 1983 the parking subsidy for solo drivers who did not use their cars for work was ended. Solo drivers then paid $57.50 a month to park in the building or chose from their other options, which included some lower-cost parking lots and scarce on-street parking in a nearby residential neighborhood.

EFFECTS OF ENDING PARKING SUBSIDIES FOR SOLO DRIVERS

The program at Commuter Computer was examined to discover the effects of eliminating free parking for solo drivers. Accounting records supplemented by telephone interviews of employees provided data on travel mode for all affected employees from January 1982 to July 1983. The data in Table 1 and in Figure 1 present the results for the 70 percent of employees who did not use their cars for work. The 30 percent who used their automobiles at work were omitted from the analysis. It is clear that there was a sudden reduction in solo driving immediately following each of the two reductions in parking subsidy.

Solo driving fell from an average 42 percent during the last 4 months when solo drivers parked free to 9 percent during the first 3 months when they

TABLE 1 Modal Choice of Employees

Date	Affected Employees[a]	Modal Choice of Employees (%)				Employee Parking ($/month)	Parking Subsidy ($/month)
		Solo	Carpool[b]	Bus	Other		
1982							
January	62	39	19	42	0	0	57.50
February	68	40	16	40	4	0	57.50
March	69	40	16	38	6	0	57.50
April	73	48	18	30	4	0	57.50
May[c]	72	33	32	30	5	28.75	28.75
June	72	37	30	33	0	28.75	28.75
July[d]	71	35	30	35	0	28.75	28.75
August	70	30	36	34	0	28.75	28.75
September	68	22	41	32	4	28.75	28.75
October	64	25	41	34	0	28.75	28.75
November	65	22	41	37	0	28.75	28.75
December	63	21	43	36	0	28.75	28.75
1983							
January	65	24	38	38	0	28.75	28.75
February	67	24	42	33	1	28.75	28.75
March	65	25	43	31	1	28.75	28.75
April	60	21	47	30	2	28.75	28.75
May[e]	61	8	61	28	3	57.50	0
June	57	7	60	26	7	57.50	0
July	55	9	54	29	7	57.50	0

Note: From January to April 1982 there was full parking subsidy; from May 1982 to April 1982 there was half parking subsidy; and from May to July 1983 there was no parking subsidy.

[a] Excludes the 30 percent of employees who continued to receive free parking because they use their cars for work.
[b] Only two employees are in a vanpool; thus they are included in the analysis as carpoolers.
[c] Parking subsidy for solo drivers was reduced to $28.75.
[d] Proposition A reduced regular bus pass price from $34 to $20; permit price was raised to $5.00.
[e] Parking subsidy for solo drivers ended.

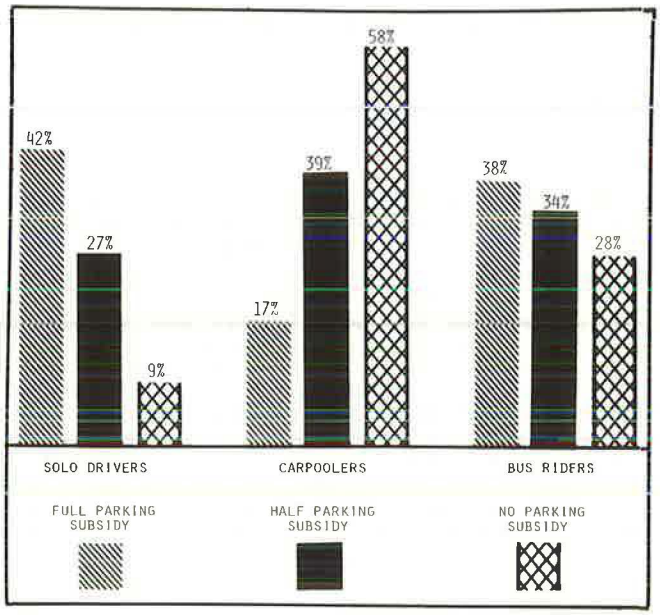

FIGURE 1 Employee modal choice and parking subsidy policy.

paid the market price to park. Of the five remaining solo drivers, as of July 1983, only one was willing to pay the $57.50 a month to park in the building. The other solo drivers parked in a cheaper ($20.00 per month) lot one block away. The share of employees carpooling or vanpooling rose from an average of 17 percent to 58 percent, and the proportion riding the bus fell from 38 to 28 percent. A χ^2 test for the significance of proportional changes between the two periods indicated that the number of solo drivers and the number of carpoolers was significantly different from what would be expected by chance, but the decrease in transit use was not statistically significant.

From the pattern of transit change it appears that many solo drivers invited bus riders to join them as carpoolers because it saved the solo driver $57.50 a month plus it split the driving cost. Second, the cash value of the carpooling subsidy was greater than that of a transit pass. A regular transit pass price is $20.00, whereas the cash value of a parking permit for two persons carpooling is $28.75 each. Thus employees were subsidized more to carpool.

The data in Table 2 give a rough estimate of what desubsidizing solo drivers did to average vehicle occupancy. It is assumed that (a) all carpools consist of two persons, both before and after desubsidizing solo drivers, and (b) 66 employees were affected (the average number of affected employees over the 19 months). Given these assumptions, the data in Table 2 indicate that the average vehicle occupancy rate rose from 1.2 to 1.8 people per car. Although 23 fewer employees drove to work alone, 26 more employees carpooled to work, so the net result is that 3 more people drove to work in 10 fewer cars. Eight percent more employees came to work by car, but the number of cars driven to work fell by 29 percent.

To test whether employment turnover affected the results, records of modal choice were reviewed for a subsample of persons employed both before and after the first reduction phase. The change in modal choice for this smaller sample of 50 employees was quite similar to the pattern for all employees included in the previous analysis. This finding strengthens the argument that price, and not some other factor such as employment turnover, explains the modal shift.

CONTROL COMPANY

As part of its rideshare matching service to client companies, Commuter Computer collects and analyzes companies' modal-split statistics. The modal-split data from a nearby company similar to Commuter Computer were used as a control. The data in Table 3 show the similarity of Commuter Computer and the control company.

Figure 2 shows the modal split at each company for April and December 1982, the two most recent dates for which data were available from the control company. During this time period the first phase of the subsidy reduction at Commuter Computer was initiated. Solo driving declined by more than half at Commuter Computer and carpooling more than doubled, whereas solo driving rose slightly and carpooling remained constant at the control company. Bus ridership increased at Commuter Computer and decreased slightly at the control company.

The comparison of Commuter Computer with the control company leads to the conclusion that the reduction in subsidy to solo driving, and not some unknown exogenous factor, is the likely cause of the changes in commuting behavior at Commuter Computer.

FINANCIAL IMPACT

Commuter Computer's cost of providing commuter allowances to employees declined 15 percent from January 1982 to July 1983, during a period when the price per space to the company increased to $60.00 per month. At the same time the cost per bus pass dropped in July 1982 from $34.00 to $20.00 because of a new sales tax enacted in the county that was tied to a general reduction in bus fares.

This modest saving was, in Commuter Computer's case, essentially a bonus because desubsidizing solo driving was based on principle and was not done primarily for financial reasons. Had parking subsidies also been discontinued for carpoolers, the outcome would have been different. Of the more than $3,000 spent on commuter allowances in July 1983, 34 percent was for carpools. Subsidies to bus riders, in contrast, constituted only 12 percent of the July commuter allowance as a result of both lower unit cost and lower use. Two carpoolers now get a subsidy

TABLE 2 Effect of Parking Subsidization on Vehicle Occupancy Rates

Subsidy	Solo Drivers (%)	Carpoolers (%)	No. of Solo Cars	No. of Carpool Cars	Total Cars	People in Solo Cars	People in Carpools	People per Car
Full	42	17	28	6	34	28	12	1.2
Half	27	39	18	13	31	18	26	1.4
No	8	58	5	19	24	5	38	1.8

Note: It is assumed that 66 employees were affected by desubsidization, and that all carpools consisted of two persons.

TABLE 3 Commuter Computer and Control Company Comparison

	Commuter Computer	Control
Location	Wilshire Corridor, 3300 block	Wilshire Corridor, 3400 block
Transit	Five bus lines directly pass building	Six bus lines directly pass building
Size	Approximately 100 employees	Approximately 100 employees
Job-related automobile use	Approximately 30 percent	Approximately 5 percent
Building parking price	$57.50 per month per space	$42.50 per month per space
Transportation fringe benefits		
Solo drivers	Free parking until May 1982, then $28.75 until May 1983, then zero	Free parking
Vanpools	$57.50 per month per vanpool	Free parking
Carpools	Free parking	Free parking
Transit	Free bus pass	Free bus pass

of $30.00 per month each, whereas a bus rider gets a subsidy of only $20.00 per month. The continued subsidization of parking helps to explain the decline in bus ridership. If all parking subsidies had been entirely withdrawn, bus ridership might have increased.

COMPARISON TO OTHER STUDIES

The results at Commuter Computer are consistent with those found in a number of other studies documenting the effects of a change in the price of parking on commuter modal split. A brief summary of these studies is given in Table 4. Only three studies document the results of reductions of parking subsidies by employers. Two other studies compare two similar groups in which one group's parking is subsidized by the employer and the other group's is not. Two studies present results of reducing rates for carpoolers, and the remaining ones deal with price increases in the form of time-specific surcharges or a tax. For a fuller description of these studies, see Miller and Higgins (1).

These studies vary widely with respect to both the effects of price and initial conditions, such as the extent of parking supply involved, the availability and price of alternative parking options, the availability and quality of transit service, ridesharing opportunities, and the incentives offered to use a particular mode. Depending on these and other factors, a change in the price of parking can dramatically change the modal split, as evidenced by the change at Commuter Computer, or have no effect, as was the case in Madison.

DISCUSSION OF RESULTS

When free parking was offered to all employees at Commuter Computer, carpoolers saved nothing on parking. Now only carpoolers park free, and solo drivers who joined a carpool each saved $57.50 a month on parking. Thus it is not surprising that ending employer-paid parking for solo drivers sharply increased carpooling.

Another way to show why ending free parking for solo drivers so strongly influenced modal split is to estimate its impact on the total out-of-pocket cost of driving to work. The average round trip to and from work in southern California is 20 miles; if the national fuel economy average of 20 miles/gal is assumed, the average work trip uses 1 gal of gasoline a day. At $1.25/gal and 22 working days per month, gasoline for the average commuter costs $27.50 a month. Therefore, ending the $57.50 per month parking subsidy for solo drivers raised the solo driver's out-of-pocket cost of gasoline and parking from $27.50 a month to $85.00 a month. This cost increase for the average 20-mile trip is equivalent to an increase in the cost of gasoline from $1.25 to $3.86/gal.

An alternative approach that could have been taken by the company would have been to offer all employees a cash travel allowance rather than subsidized parking (2,3). Employees would then have a choice of paying for their own parking or choosing another mode, with the option of pocketing the difference if a less-expensive alternative were chosen. A discouragement to this alternative is that employees are not subject to tax for the cash value of

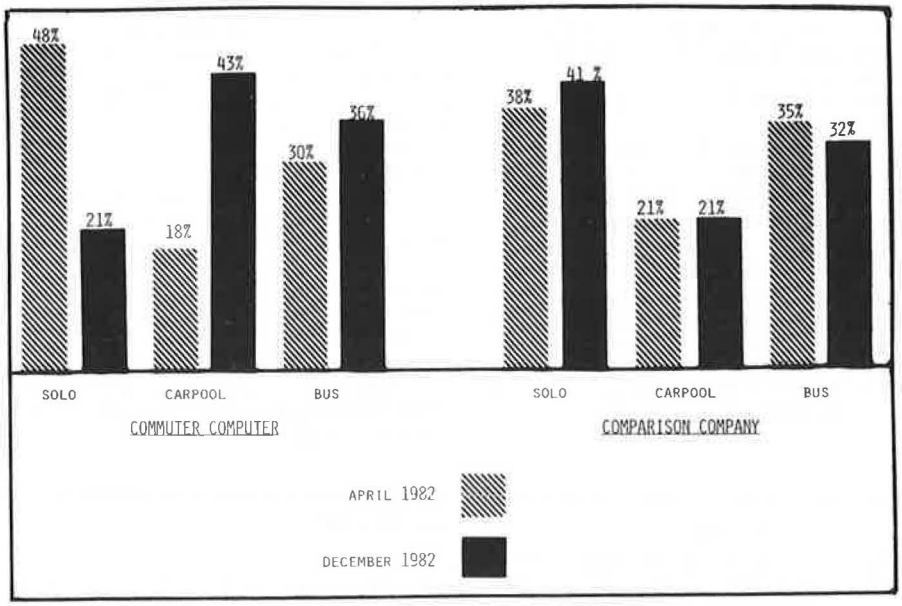

FIGURE 2 Modal split of Commuter Computer and comparison company.

TABLE 4 Parking Price Impacts on Modal Use

Study Location	Price[a]	Modal Split	Other Conditions
Reduced Employee Subsidies			
Bellevue, Washington CBD–1982 *(1)*	Pre-1982 employees provided free parking, poolers also given $35; post-1982 solo driver employees pay $35 to park, poolers park free, other modes paid $10	36 percent of all employees nonsolo mode, 23 percent carpool	No on-street free parking, little commercial parking
District of Columbia, city and suburban–1980 *(1)*	$0-$33 at all government lots in metropolitan area	1-10 percent automobile use reduction in city; 2-4 percent drop in suburban sites	Free on-street parking in some areas; transit level varied
Ottawa, Ontario, Canada CBD–1975 *(1)*	$20-$24 increase to 70 percent of commercial rate at all federal spaces	20 percent drop in solo automobile use, 16 percent rise in bus use	High level transit, limited parking
Subsidized and Nonsubsidized Comparisons			
Century City, California (high density employment center)–1976 *(2)*	Pays $40 a month for parking Pays approximately $20 a month Pays $0 per month	75 percent solo, 13 percent pool 85 percent solo, 9 percent pool 92 percent solo, 4 percent pool	Limited parking, high congestion, medium-high level transit
Los Angeles–1961 *(2)*	Pays $16 a month for parking Pays $0 a month for parking	40 percent solo, 27 percent pool, 3 percent bus 72 percent solo, 16 percent pool, 12 percent bus	Limited parking, high congestion, high level transit
Reduced Rates for Carpoolers			
San Francisco, near CBD–1980 *(1)*	$35-$60 reduced to $10 at three state lots	Attracted poolers from other lots (85-90 percent), from transit (3-5 percent), from solo (3-5 percent)	High level transit
Seattle, near CBD–1974 *(1)*	$25 permit reduced to $0 and $5 at two city lots	Attracted poolers from other lots (38 percent), from transit (40 percent), from solo (22 percent)	High level transit
Other Parking Price Change Studies			
Madison, Wisconsin (high density state capital and university)–1981 *(1)*	$1.25 surcharge at three off-street facilities between 6:30-9:30 a.m.	No shift to carpools or transit, shifted to other facilities	High level transit
Eugene, Oregon (city core)–1980 *(1)*	$16 increase at two garages; $6-$16 increased to $16-$24 at several lots	200 fewer permit sales; 40-50 carpooling, 30-40 used shuttle	Medium level transit; carpools (3 persons) park free; carpools (2 persons) get 20 percent off; free parking and shuttle from outlying lot
Chicago CBD–1978 *(1)*	30-120 percent increase at eight city lots	Aggregate 35 percent fewer cars, shorter duration, 72 percent decline in pre-9:30 a.m. parkers	Transit predominant CBD mode, short-term rates lower than commercial rates
San Francisco–1970 *(1)*	25 percent tax on off-street parking at 13 city garages	No. of parked cars declined at seven lots, increased at six lots, duration declined	High level transit, variation in competing lots

[a]Price column shows different values for each category, as follows: reduced employee subsidies = price increase; subsidized and nonsubsidized comparisons = price differences; reduced rates for carpoolers = price reduction; and other parking price change subsidies = price change.

parking supplied as a fringe benefit. Adding a travel allowance to taxable income would be opposed for this reason. Although federal legislation has been discussed to make this allowance tax free, no action has been taken to date.

Because the employees in this study worked for a ridesharing agency, it could be assumed that they were more likely to rideshare than employees whose business was not the promotion of ridesharing. But it could also be argued that because they work at Commuter Computer and are already aware of all the benefits of ridesharing, those who continue to drive alone would be a group less prone to rideshare than a similar group of solo drivers not already aware of the benefits. In any case, the economic incentive for switching modes was undoubtedly more critical than the nature of the business of the firm.

CONCLUSION

Ending free parking for solo drivers at Commuter Computer dramatically reduced solo driving. Solo driving decreased from 42 percent of the modal split during the last 4 months of free parking to 8 percent during the first 3 months after the parking subsidy for solo drivers was ended. Carpooling rose from 17 to 58 percent, and bus ridership declined from 38 to 28 percent during the same period. Vehicle occupancy among those driving to work is estimated to have risen from 1.2 to 1.8 persons per car.

The situation at Commuter Computer was unique in several respects: the parking subsidy was removed only for solo drivers who did not use their cars for work; and carpools, vanpools, and bus riders continued to receive subsidies. The organization's mission is to promote ridesharing and to provide rideshare matching services, and matching services were immediately available to all employees.

Given these qualifications, this case study demonstrates that employer-paid parking for solo drivers encourages solo driving, and that ending employer-paid parking for solo driving can greatly encourage ridesharing.

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Effects of Parking Measures in the Center of Leeuwarden

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ABSTRACT

In the center of Leeuwarden, a town with approximately 85,000 inhabitants in the northern part of The Netherlands, new parking regulations were introduced that caused radical changes in parking policies. A before-and-after study has been carried out to get information about the effects of the new parking policy. The effects can be divided into the effects on the parking system (primary level), the effects in relation to the transport system (secondary level), and the effects on the spatial and economic system (tertiary level). The situation before the introduction of the parking measures is compared with the situation a year after their introduction. The results of the before-and-after study are discussed in detail.

Parking in the town centers in The Netherlands is a matter of constant concern. Various categories of motorists require parking space in the town center, but people who work there often occupy much of the parking space. Consequently, the number of parking places remaining for residents, tradespeople, and shoppers and visitors to businesses are believed to be insufficient. Ease of parking for people visiting town centers thus leaves much to be desired.

A large number of municipalities have therefore started regulating the use of parking space by residents, persons working in the city centers, and visitors. The principal measures used are those that restrict parking duration or that owe their effect to the operation of a price mechanism.

It is important to understand the effects of these measures in the urban centers. Do they serve their purpose? Are there any unexpected side effects? What effect do they have on the parking behavior of people working in and visiting the center?

The Project Bureau for Integrated Transport Studies had the opportunity to answer some questions of this nature, in consultation with the Leeuwarden municipal authorities. In November 1979 parking measures were introduced in the Leeuwarden city center that altered the parking situation drastically. Several surveys were carried out to determine the effects of these measures.

The results of the parking surveys are reported. The parking situation before the introduction of the measures is reviewed. This is followed by a description of the measures and the parking surveys, and also a discussion of the new situation. Finally, a number of conclusions are drawn.

PARKING SITUATION BEFORE INTRODUCTION OF MEASURES

Leeuwarden has about 85,000 inhabitants. The town center comprises the inner core, surrounded by canals and linked by eight bridges to the rest of the town and the station area. The center has about 2,800 inhabitants and a working population of more than 11,500 (1980 figures). It covers an area of about 900 x 1000 m. Figure 1 shows the exact boundaries.

The parking situation in the second half of the 1970s was considered unacceptable in several respects. In absolute terms, there was a shortage of parking space. Moreover, people working in the center were taking up parking areas intended for visitors and shoppers. The latter group tend to pay their calls in the second part of the morning, or in the afternoon, from 2:00 p.m. onwards. The working population, however, arrives earlier, both in the morning and in the afternoon, than the majority of visitors. The consequence is that visitors have to walk considerable distances or else park in places not intended for that purpose. The residents and tradespeople in the town center were also having problems. It was often difficult for them to find a parking place when they returned to their homes or business premises because any places reasonably close to their destination were taken by people working in or visiting the center.

PARKING MEASURES

The main objective of the parking plan (1) drawn up by the local authorities is to reallocate the number of parking places in a way that is attuned to the various categories, each with their own requirements