Parking Subsidies and the Drive-Alone Commuter: New Evidence and Implications

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Employers commonly subsidize the parking costs of commuters who drive alone to work. Yet these subsidies lead to inefficient commuter mode choice. Two 1986 surveys of downtown Los Angeles commuters are described that add to what is known about parking subsidies. The surveys reveal that most downtown Los Angeles employers subsidize parking to a substantial degree. Many drive-alone commuters pay nothing for parking. These subsidies (and employer decisions regarding them) influence the decision-making process of commuters and distort the market for commuter parking spaces. The author discusses how knowledge about subsidies can clarify current issues in transportation and argues that subsidies must be considered in the development of transportation policies and programs. Finally, consideration is given to how research efforts should address the parking subsidy issue. For example, the degree and nature of the relation between parking subsidies and mode choice require further investigation. How sensitive are commuters to parking prices when the subsidized price is so low compared with other out-of-pocket and time costs? And how do employers make decisions about the parking and other transportation benefits they offer? In conclusion, a number of research areas are suggested for further investigation.

Traffic congestion continues to dominate the planning agenda in central city and suburban areas. Many point to the drive-alone commuter as a major contributor to peak-hour congestion. In response, transportation demand management (TDM) strategies focus on inducing drive-alone commuters to shift to carpool, vanpool, and transit.

An array of public and private incentives is used to achieve this objective. Transit improvements, ride-matching services, employer incentive programs, and transportation management organizations are just a few examples. However, it is now well established that these incentives compete against a powerful incentive for driving alone—free or subsidized employee parking.

In this paper, results of surveys of commuters and employers in downtown Los Angeles are added to the existing evidence on the extent of employer subsidies for parking. Characteristics of the subsidies, their impacts on commuter mode choice, and the implications of these findings for transportation and parking policy are discussed. Finally, a series of research questions is posed for subsequent investigations.

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Some background on downtown Los Angeles is needed to understand the context for the findings. Office space in the downtown area has grown rapidly in the last two decades, primarily in the financial sector. The downtown area has the largest office concentration in the region and is the hub for the regional freeway and bus systems. Both light and heavy rail transit systems are being built to serve downtown. Finally, transportation demand programs are being implemented by the developers of new projects.

Traffic congestion on local streets and the freeway systems is worsening, and local politicians and civic leaders are calling for further action. The density of downtown development projects is being scrutinized more closely than had been done previously. Moreover, development control ordinances and ballot initiatives have been proposed and adopted in other parts of the city and may soon apply to the downtown area.

Local government agencies are working on transportation problems. However, not all agree on solutions, especially those relating to parking policy, which is perhaps the most acrimonious issue of all. The private sector is beginning to come to grips with the issue of parking subsidies but so far is not committed to any change.

PARKING SUBSIDIES AND MODE CHOICE

Shoup has argued that free or subsidized parking has a major impact on mode choice (*1*). He uses census data, predictive models, and case studies to show the effect of subsidized parking on drive-alone commuting patterns, and reveals that according to national census data, 93 percent of all commuters park free at work (*1*).

Shoup shows that for most commuters, free parking is a larger financial incentive than free gasoline. In addition, parking subsidies are not taxed as income and are therefore of even greater benefit to employees. Overall, he concludes that at least 20 percent of all those who park free and who drive alone would switch to a rideshare mode if they had to pay for parking (*1*).

This is not to argue that other factors are not significant in determining mode choice. Commuters base their mode selections on a complex set of criteria including cost, convenience, safety, travel time, and social reasons. However, parking subsidies are a powerful influence—one that policy makers can change through public- and private-sector actions.

Some of the difficulties with parking subsidies are evident in downtown Los Angeles. For example, Metro Rail (a proposed $4.4-billion, 18-mi subway) will increase mobility in a major travel corridor leading to the downtown area. Sizable ridership is needed to justify the capital costs of the system. However, many downtown commuters do not pay for parking. Employers provide this free parking in an area with some of the highest land costs in the western United States. The result is competing incentives—extensive public subsidy for transit and low automobile commute costs resulting from private parking subsidies.

CHANGING PARKING SUBSIDIES

A number of solutions to the parking subsidy problem exist. For example, "cashing out" parking subsidies gives employees more choice about how to spend that money. Currently, most employees cannot trade a parking benefit for other benefits or income. Parking taxes and other pricing strategies can also be used. In a study of parking management strategies, DiRenzo et al. organize pricing tactics into three categories (*2*):

- Parking rate increases achieved through general rate increases, revisions to rate structure, parking taxes, and parking surcharges;
- Differential pricing programs for short-term versus long-term parking, carpools and vanpools, and other programs; and
- Changes in employer parking subsidy programs, including reduction in subsidies and transit-HOV subsidy programs.

Employer parking subsidies can be removed or reduced by (a) increasing rates in employer lots, (b) dropping subsidies for commercial lots, or (c) cashing out parking benefits with a monthly transportation subsidy (*2*).

The evidence of the effectiveness of these alternatives is limited, especially for individual employer programs. The strongest case is in Ottawa, Canada, where the federal government increased parking rates for their employees from no charge to 70 percent of the commercial rates. There was a 23 percent reduction in the number of employees driving to work, an increase in automobile occupancy from 1.33 to 1.41, and a bus ridership increase of 16 percent (*2*).

Despite this background, parking subsidies are often not directly addressed in transportation traffic mitigation programs. The issue of parking subsidies is perceived as being too intrusive to the business operation of developers and other employers. Critics also question the ability of the private sector to regulate parking prices and to enforce those regulations.

Examples of two traffic mitigation programs illustrate this point. One approach is to require rideshare incentives but not to directly address parking subsidies or pricing. The Coastal Corridor Transportation Specific Plan in Los Angeles is an example of this approach. This plan gives developers credit on a traffic impact fee if they provide rideshare incentives such as transit passes or carpool and vanpool incentives (*3*).

A step closer to effecting changes in parking subsidies is the requirement included in new developments by the Los Angeles Community Redevelopment Agency (CRA). Developers must meet a performance target for rideshare participation in their project or face penalties (*4*). The agreement does not specify the programs and incentives for meeting the targets. However, developers and employers are likely to find adjustments to parking prices and subsidies a cost-effective way of achieving the performance target.

NEW EVIDENCE ON EMPLOYER PARKING SUBSIDIES

The data presented in this section draw from two recent surveys of commuters and employers in downtown Los Angeles. The first is an extensive baseline survey of more than 5,000 employees in 118 companies (*5*). It was conducted in June 1986 and included both employee and employer surveys. CRA commissioned the survey; Barton-Aschman Associates, Inc. and Recht Hausrath & Associates completed it.

The survey objectives were to provide information on the travel conditions, travel characteristics, and the mode split of downtown office commuters. It also determined mode-split characteristics by subgeographic area and by socioeconomic and employer attributes. CRA is using the survey to establish rideshare participation targets for rideshare program agreements. Survey findings will also help define transportation management programs for the downtown area.

As mentioned, the baseline survey included both employers and employees. CRA required statistical confidence for the ridesharing percentages from the employee survey. However, the employer survey did not achieve the same level of statistical confidence, because the sample was smaller and the population was not representative of all employers in the study area. The employer survey did provide a reasonable cross section of office employers and provided new information about their parking policies. With this caveat, the results of the employer surveys are used in some of the analyses that follow.

The second survey consisted of telephone interviews with 226 downtown workers, probing their attitudes regarding parking. The survey was completed in August 1986 to be used in the design of a peripheral parking program (*6*). CRA commissioned this survey also; Kotin, Regan Mouchly, Inc. was the consultant.

Information relating to parking subsidies by employers is derived from these surveys and presented in key categories of interest. Overall, the data show extensive employer involvement and subsidization of parking for commuters.

Characteristics of Employer Subsidies

Employer subsidy of parking is widespread—only 14 percent of the employers who responded to the baseline survey do not provide such subsidies. Twenty-nine percent of employers offer free parking to all employees. Apart from a 19 percent nonresponse, the remainder of the responses fell somewhere in the middle—free parking for some employees or subsidy for some or all employees. Figure 1 details the responses to this question.

The finding of the baseline survey on parking subsidy is comparable with that of a previous survey conducted in 1974, which indicated that more than 25 percent of the daily downtown automobile commuters parked free (*7*). Therefore, free parking is just as prevalent now as it was in the 1970s. This has occurred despite the fact that employer cost for the subsidies has increased substantially, because parking price increases have far outpaced inflation.

These data confirm that employers are the ones who make critical decisions that influence employee mode choice. Public policy approaches that appeal to commuters to change modes must address free or subsidized parking and the decision-making processes of employers. In addition, efforts to model commuter mode choice must use the "after subsidy" price to commuters as an independent variable, not the quoted parking costs.

Employer response to questions about the amount of parking subsidy indicate a broad range of subsidies. The median daily parking cost is approximately $5 (*6*). One-fourth of the employers surveyed provide a $5 subsidy or more, generally indicating that they pay the full cost of parking (*5*). Other subsidies were fairly evenly distributed among lower ranges, representing a variety of parking prices and subsidy levels. From the aggregate reported average parking subsidy, the median subsidy is $3.71 per day (*5*). Figure 2 provides more details.

These subsidy levels represent a substantial transportation investment by employers. The annual cost to an employer with 500 employees (70 percent of whom drive) to provide a parking subsidy of $3.71 per driver is $339,000. Taking this a step further, the estimated annual private-sector expenditure on parking subsidies in downtown Los Angeles is $118 million (median subsidy of $3.71 per day per driving employee, or $968 per year times 175,000 employees times 70 percent of employees who drive). This amount is almost equivalent to the entire private-sector contribution to the Metro Rail project through benefit assessment.

FIGURE 1 Los Angeles CBD employee travel survey: Question 36—employee parking subsidies (*5*).

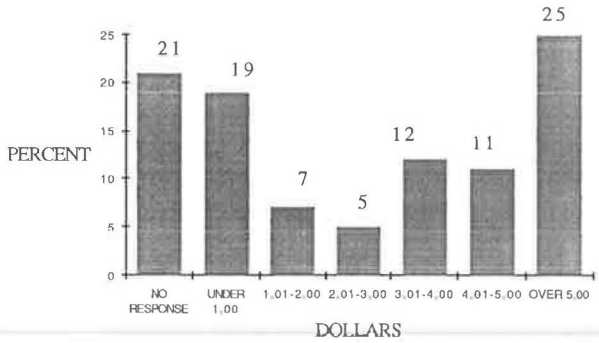

FIGURE 2 Los Angeles CBD employee travel survey: Question 15D—average parking subsidy (*5*).

Parking subsidy costs are much greater than the cost of employer-provided rideshare programs, as was indicated in a national survey examining employer involvement in employee transportation. Sixty-five percent of employers spend less than $5 per employee per year on rideshare programs. The category with the highest response, 7 percent, consisted of employers who spend over $50 per employee per year in rideshare costs (*8*). Clearly, the employer cost is far lower for rideshare programs than for parking subsidies.

The opportunity cost of parking subsidy expenditures is significant. Not only does the money represent lost income for either the firm or the employee, but it encourages commuting patterns that increase congestion. Much of the cost of solving the resulting congestion problems then falls on the public sector. Road widenings, environmental mitigation, and other programs are required, at considerable expense.

An additional area of interest is the basis on which employers provide subsidized parking. There was significant nonresponse to this question (66 percent), so the response must be interpreted with caution. Most responses fell into two categories—seniority (16 percent) and job classification (13 percent). Because employers rely on these factors, reductions in subsidies could bring more equity to the distribution of transportation benefits among employees.

Employer policies on assigning free parking can vary widely. Transportation planners should study these policies at a disaggregate level to understand the dynamics within job classifications and among employer type and size categories.

Response to Employee Surveys

Employee responses in the baseline survey generally corroborate the information reported by the employers. Re-

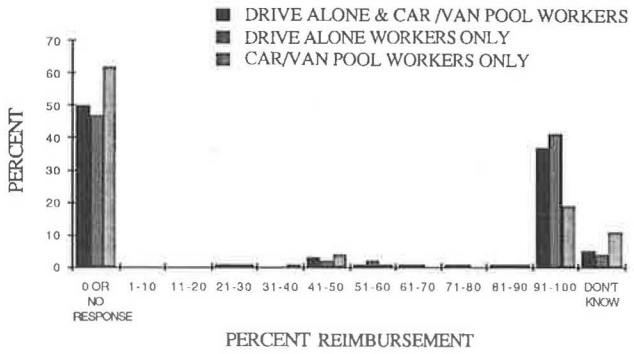

FIGURE 3 Los Angeles CBD employee travel survey: Questions 16 and 35—parking reimbursement (*5*).

sponses to questions concerning parking reimbursement indicate that 37 percent of employees are reimbursed for 91 to 100 percent of their cost (Figure 3). The rate of nonresponse was 50 percent for this question.

Nonresponse was a problem in many of the questions about employee parking cost or reimbursement level. It may be that employees do not know their true parking costs or subsidy. Further research is needed to determine the reason for the high level of nonresponse.

One surprising finding is that a greater percentage of drive-alone workers reported 91 to 100 percent parking cost reimbursement than did carpool or vanpool participants. (Among drive-alone workers, 84 percent knew their level of reimbursement; 70 percent of carpool or vanpool workers knew their level of reimbursement.) Ideally, incentives should favor those in carpools or vanpools. See Figure 3 for details.

There are two possible explanations for higher drive-alone parking reimbursement. First, the nonresponse rate for these questions was substantial, and the results may not be representative. Second, it may be that carpools and vanpools were formed by commuters in response to a lack of employer subsidy of parking cost.

The telephone survey of commuter attitudes provides some additional useful information about parking behavior. To reduce cost, the consultant based the sample for this survey on a 3-year-old data base. Therefore, some bias may exist in the results, because respondents were downtown employees with a tenure of at least 3 years. The survey took place in 1986.

Most respondents to the telephone survey (95 percent) arranged for parking on a monthly basis. Therefore, commuters do not make a day-to-day trade-off in terms of parking location, cost, and convenience. Second, 83 percent of respondents indicated that they had not changed their parking location in the last 12 months. Most of those who changed did so because of a job shift (60 percent). Only 22 percent of those who changed did so because of parking cost.

The picture that emerges from these data, when combined with the employer subsidy information, is of a parking market in which employers make the decisions about parking. Employees do not shop for parking, make trade-offs, or otherwise change their parking arrangements. They accept (or demand) subsidized spaces from employers.

Level of Drive-Alone Commuting

The baseline survey determined that drive-alone commuters represent 59.8 percent of total office commuters. The confidence interval is ±4.3 percent, at a 95 percent confidence level. Rideshare commuters represented 38.1 percent of the total ±4.7 percent (*5*). Table 1 gives a breakdown of the data for the study area, which included most of the office development in downtown Los Angeles.

The baseline survey was used to compare these results with those from a previous commuter mode survey conducted in 1981. It was found that drive-alone commuters represented 52.3 percent of all commuters (*7*). The 1981 study used a wider range of employment classifications than did the baseline survey.

Despite some differences in samples, the two sets of results suggest no decrease in drive-alone commuting. This is not a surprise, because no major transit improvements have been completed as of the more recent survey date, and gas prices are low. In addition, recent bus service cutbacks and fare increases have affected transit ridership. However, this may change. As congestion becomes more severe, the advantages of convenience and time inherent in driving alone to work may diminish.

No attempt is made here to develop a predictive model of mode choice using survey data. However, in disaggregate form, the baseline survey data can be used to examine those relationships. Suggestions are made in the sections

TABLE 1 LOS ANGELES CBD EMPLOYEE TRAVEL SURVEY: OFFICE WORKER RIDESHARING (*5*)

COMMUTE MODE	PROPORTION OF COMMUTERS	CONFIDENCE INTERVAL
DRIVE ALONE	59.8%	+/- 4.3%
WALK AND OTHER	2.1%	+/- 1.2%
RIDESHARE (TOTAL)	38.1%	+/- 4.7%
Carpool/Vanpool	3.1%	+/- 1.1%
Drove w/ > 1 Person	14.1%	+/- 2.4%
Bus/Train	20.9%	+/- 3.7%

that follow concerning policy implications and follow-up research.

IMPLICATIONS FOR PARKING POLICY

The findings of the surveys reflect conditions in downtown Los Angeles in the summer of 1986. The reader should exercise caution in drawing conclusions about other cities or employment centers from these results. The findings frame issues for subsequent investigations and replication efforts. Summarized below are comments on various policy issues in light of the initial findings of the surveys.

Parking Taxes

Many have proposed parking taxes as a way of reducing drive-alone commuting. The survey finding that most applies to this policy option is the extent of employer involvement in paying for parking. In many cases, the incidence of a parking tax would affect the employer, not the individual commuter. Therefore, predictions of commuter mode changes must take into account the likely action of employers in modifying their parking subsidies. Employers could pass the cost along, absorb the cost, shift subsidies to other modes, or relocate. Significant uncertainty exists regarding likely employer responses to such a policy. It is possible that many commuters would not be aware of any parking-tax-related increase in parking cost because they do not pay any of their parking cost now.

Parking Supply Restrictions

The survey responses suggest that policies restricting parking supply may affect employers more directly than employees. Employers are generally responsible for providing parking along with the job, and it is likely that employees will continue to demand parking spaces. In Los Angeles, jobs may be available in multiple employment centers, so some employers may have a difficult time attracting employees.

Parking supply restrictions can work if the public or private sector provides commute-mode alternatives when the parking supply is restricted. Therefore, transportation planners must develop parking management and other TDM measures in close cooperation with employers.

Transit Investments

Because of the prevalence of parking subsidies, rail transit planners must coordinate their improvements with revisions in parking policy. This coordination is difficult in Los Angeles because of the multiplicity of agencies with responsibility for transit and parking. However, ignoring these parking subsidies can seriously reduce transit ridership. Policies should be aimed at releasing funds used for parking subsidies and redirecting them into transit pass programs. The cost of a Southern California Rapid Transit District (SCRTD) monthly pass is half the median monthly parking fee. Again, it is up to the employer to shift incentives that influence commuter mode choice.

Peripheral or Off-Site Parking Strategies

Policy makers have proposed schemes to limit on-site permit parking and require the provision of peripheral intercept lots. A major question is whether commuters will accept the additional travel time and inconvenience to use such a system. The answer depends again on the level of involvement of the employer. Attempts to lure subsidized commuters directly to peripheral lots will almost surely fail. No amount of subsidy can overcome free or subsidized employer parking at or near the work site. However, because of the extent of the subsidy received by commuters, employers who move subsidized spaces to peripheral locations would likely find that commuters follow the subsidy.

SUGGESTED RESEARCH

The findings of the surveys suggest a number of areas for research in parking policy.

Replication of Study Findings

Similar surveys are needed in different cities and of different types of employment centers so that a broader base of knowledge on parking subsidies can be developed. Although transportation and land use conditions can vary substantially between cities, there may be a commonality in the way that employers make decisions about parking subsidies.

Suburban areas are also of interest, because free parking is much more prevalent there. As land values and densities rise in suburban areas, parking charges will be more frequent. The reactions of employers and commuters to these parking costs will likely have a major impact on mode-split trends in suburban areas.

Models

Planners need simple models to predict how alterations to parking policies will divert drive-alone commuters to other modes. Of course, such models must hold constant the other factors involved in mode-choice selection. The data from the baseline survey are a good source for further research in this area.

A few comments are appropriate concerning the modeling task. First, if modelers include parking price as an

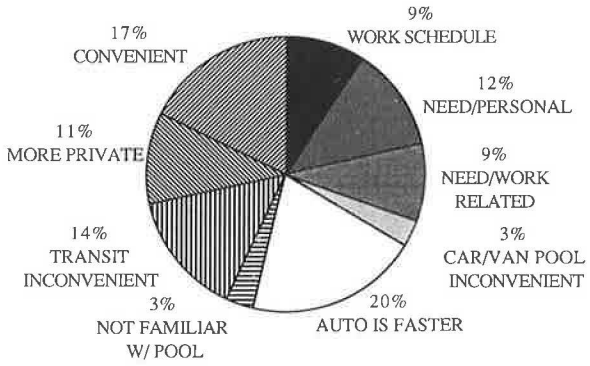

FIGURE 4 Los Angeles CBD employee travel survey: Question 36—most important reason for driving alone (*5*).

independent variable, it must be the after-subsidy price. Using surveys of market-rate parking prices would misspecify a model. Second, modelers need a technique for predicting the response of employers to changes in the parking cost and supply in order to have some certainty about employers' subsidies and the stability of the after-subsidy price over time.

An additional issue concerns the threshold levels at which either low or high parking prices become incentives or disincentives in commuter mode choice. It may not be possible to model commuter response to pricing changes using linear or transformed linear equations. There may be certain high and low thresholds where parking price is a determinant. Between these thresholds, commuters may be relatively indifferent to changes in parking price. The parking subsidies in downtown Los Angeles may be so great that parking costs are simply not a part of many commuters' mode-choice decision.

The baseline survey does not provide as much information in this area as would be desirable. Drive-alone commuters were asked why they chose that mode. Most respondents cited the speed and convenience of the automobile and the inconvenience of transit as the main reasons for driving alone to work (see Figure 4). However, the questionnaire did not list subsidized parking as a potential response—an oversight in the questionnaire design.

It is difficult to determine how many drive-alone commuters would have indicated that low parking prices are a factor in mode selection had that response category been included in the survey. One way to use the existing data would be to disaggregate the responses by level of subsidization to determine how the reasons for mode choice change with varying parking subsidy levels.

Employer Decision-Making Process Regarding Employee Benefits

The decision-making process of employers in evaluating subsidy programs is not well understood. Depending on the type of company, decision-making processes may vary widely. However, it is this process that is the key to altering the commuting patterns of employees. Public regulation and programs must recognize this process as central and find ways to affect it. For example, regulating developers without attention to eventual tenants will not yield good results. Personnel departments usually make the recommendations about parking subsidies, but there is evidence of increasing upper-management involvement in these decisions.

The Wagner and Schueftan survey of employer attitudes toward transportation for employees is a key first step in identifying how employers view their transportation benefits (*8*). Planners need more information on how to affect employer policies.

Parking and Congestion Pricing Mechanisms

Employers and building owners usually resist attempts to change their parking policies. Public-sector officials are reluctant to change parking policies and perceive high political risk. These difficulties exist when the mechanism under consideration is public regulation. There are practical and legal difficulties in regulating parking subsidies offered by employers to employees. Development agreements offer the most potential, but enforcement problems are significant.

More study is needed on the use of mechanisms that price the amount of congestion generated by a development and permit buying and selling of congestion rights. Building owners and employers could then reap economic benefits by reducing drive-alone commuting, using rideshare incentives and drive-alone parking disincentives as appropriate. Altering parking price policies would likely be a frequently used strategy. This "pricing" approach offers more potential than regulation, which may be met with resistance.

CONCLUSIONS

Two commuter mode surveys were recently conducted in downtown Los Angeles. They indicate that employers strongly subsidize employee parking. These subsidies mean that very few employees shop independently for parking, and few make decisions based on true costs. Despite the substantial cost of these subsidies to employers, there is no evidence that their use is diminishing.

Other studies have shown the effect of parking subsidies on mode choice. Employers must reduce these subsidies if investments in transit and rideshare incentives are to succeed. As land values and congestion levels continue to grow, the opportunity cost of this misallocation of employers' subsidies is becoming more apparent.

Solutions to this problem lie with changing employer benefit policies. Programs that focus on the commuter alone miss the target. Yet knowledge of how to change employer policies is limited. One approach that some cities have taken is regulation of employers (for rideshare participation). The success of these efforts will depend on how well

employers' decision-making processes regarding employee benefit packages are understood—how employers decide on benefits and how they can be persuaded or induced to alter them.

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