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The Employer-Paid Parking Connection**

Donald C. Shoup
Richard W. Willson

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**The University of California
Transportation Center**

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**Commuting, Congestion, and Pollution:
The Employer-Paid Parking Connection**

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Working Paper, No. 120

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Arlington, Virginia
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The University of California Transportation Center
University of California at Berkeley

COMMUTING, CONGESTION, AND POLLUTION:
THE EMPLOYER-PAID PARKING CONNECTION

by

Donald C. Shoup and Richard W. Willson

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COMMUTING, CONGESTION, AND POLLUTION: THE EMPLOYER-PAID PARKING CONNECTION

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EXECUTIVE SUMMARY

Employer-paid parking is a form of matching grant whereby an employer offers to pay the cost of parking if employees are willing to pay all the other costs of driving to work. In this paper we estimate how employer-paid parking increases the number of vehicle miles travelled to work, the energy consumed by commuting, and total spending on parking and automobile commuting. We then attribute the ubiquity of employer-paid parking to the anomalous federal and state income exemption of employer-paid parking subsidies, and propose a tax policy that will encourage employers to offer their employees the option to choose a cash travel allowance in lieu of a parking subsidy. Finally, we estimate the benefits of cashing out parking subsidies, and argue that cashing out parking subsidies is a fair, efficient, and simple first step to improve transportation pricing.

One way to illustrate how parking subsidies strongly influence commuters' travel costs is to compare the average employer-paid parking subsidy to a hypothetical congestion toll. For commuters who receive employer-paid parking in downtown Los Angeles, the average employer-paid parking subsidy is equivalent to 11 cents per mile travelled to and from work. Thus, imposing a congestion toll of 11 cents per vehicle mile travelled would raise the cost of driving to the Los Angeles CBD by only as much as employer-paid parking already lowers it.

We use a survey of 5,060 commuters to downtown Los Angeles to estimate how employer-paid parking affects transportation system performance. To summarize the results, we find that employer-paid parking:

- ⊗ increases the number of solo drivers by 44 percent
- ⊗ increases parking demand by 34 percent.
- ⊗ increases automobile vehicle miles travelled to work by 33 percent.
- ⊗ increases gasoline consumed for driving to work by 33 percent.
- ⊗ increases the cost of automobile travel to work by 33 percent.
- ⊗ increases the total cost of parking at work and driving to work by 33 percent.

Although employers spend an average of \$750 per employee per year for parking subsidies (\$563 in replaced employee spending, and \$187 in stimulated spending), the employees' own average spending for parking and driving declines by only \$183 per year. *The net effect is that the employer must spend \$4.10 on parking subsidies for every \$1 the employee saves on the cost of parking and driving.* This surprising disproportion between the large amount employers pay and the small amount employees save is explained by employer-paid parking's strong stimulus to spending on both parking and driving: the stimulus to parking demand inflates what employers have to pay, and the stimulus to driving diminishes what the employees save.

In offering to pay for their employees' parking at work, employers are responding to the Internal Revenue Code's so-called "special rule for parking," which defines employer-paid parking subsidies as a "working condition fringe" that is exempt from income taxation. Given the political difficulty of taxing employer-paid parking subsidies, we recommend the alternative policy of amending the special rule for parking in Paragraph (4) of Section 132(h) as follows:

The term "working condition fringe" includes parking provided to an employee on or near the business premises of the employer *if the employer offers the employee the option to receive, in lieu of the parking, the fair market value of the parking subsidy, either as a taxable cash commute allowance or as a mass transit or ridesharing subsidy.*

The nonitalicized portion is the full text of the existing special rule for parking, and the italicized portion is the proposed change.

This proposed cash-out option has several important advantages. No employee would lose any existing parking subsidy, but offering employees the option to choose between a free parking space and cash makes it clear that parking has an opportunity cost, which is the cash not taken. Therefore, many employees who are now offered free parking at work would begin to behave as though they paid for parking. Federal and state income revenues would increase when anyone chooses the taxable cash option in lieu of a tax-exempt parking subsidy, and the lowest-paid workers would gain the most after-tax cash from a taxable cash allowance in lieu of employer-paid parking, because they are in the lowest income tax brackets. Finally, employers are no worse off if an employee chooses the cash option because the cash alternative is no more costly than the parking subsidy.

We estimate that offering the cash option to employees who now receive employer-paid parking would reduce their solo driving share by 20 percent, and the number of vehicle miles

travelled per employee by 17 percent. This reduction in vehicle miles travelled would reduce the total cost of automobile commuting to downtown Los Angeles by \$40 million per year, and would save 3.5 million gallons of gasoline per year.

By allowing market prices to influence commuters' travel choices, a regulation requiring employers to offer employees the *option* of the equivalent cash value of any parking subsidy would reduce traffic congestion, air pollution, and gasoline consumption, and would increase federal and state income tax revenue. It would do all this simply by allowing commuters to make travel choices according to their own preferences about how they wish to spend their own income.

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COMMUTING, CONGESTION, AND POLLUTION: THE EMPLOYER-PAID PARKING CONNECTION

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I. INTRODUCTION: CONGESTION PRICING *VERSUS* PARKING PRICING

Parking pricing and congestion pricing are often seen as alternative means to reduce traffic congestion, with parking pricing usually regarded as a potentially useful but rather blunt instrument when compared to the elegant precision of congestion tolls. Our own view is that parking pricing and congestion pricing are not alternatives, but complements. Both congestion tolls and parking charges should be used to price scarce transportation resources consumed by cars, whether these cars are in motion or at rest. Further, if parking subsidies at trip destinations reduce the cost of automobile use, congestion tolls will have to be set higher than if parking is not subsidized, and the higher the congestion toll the harder it will be to justify it politically. Therefore, anyone interested in congestion prices should also be interested in parking prices.

Our purpose in this paper is to estimate how employer-paid parking, which is an important feature of parking pricing, affects the number of vehicle miles travelled to work, the energy consumed by commuting, and total spending on parking and automobile commuting. We then attribute the ubiquity of employer-paid parking to the anomalous federal and state income exemption of employer-paid parking subsidies, and propose a tax policy that will encourage employers to offer their employees a cash travel allowance in lieu of parking subsidies. Finally, we compare and contrast the benefits of cashing out parking subsidies to the benefits of introducing congestion tolls, and argue that cashing out parking subsidies is a fair, efficient, and simple first step to improve transportation pricing.

II. MOST EMPLOYERS SUBSIDIZE EMPLOYEE PARKING

Congestion pricing is a proposed, selective intervention in the transportation market to raise the price motorists pay for travel at peak hours. In contrast, employer-paid parking is an already existing, ubiquitous intervention in the transportation market that lowers the price motorists pay for travel to work, most of which is at peak hours.

There is ample evidence to show that most commuters pay nothing to park at work. The first nationwide estimate found that 93 percent of all auto commuters parked free at work (Shoup and Pickrell, 1980). More recently, a survey of large SMSAs found that 90 percent of those who drive

to work park free (Center for Urban Transportation Research, 1989). In the Washington, D. C. metropolitan area, Williams (1992) found that 82 percent of all commuters' automobiles parked free at work. Even in downtown Washington, where parking charges are highest, 74 percent of all commuters' autos parked at federal facilities paid nothing for parking, and another 22 paid a discounted rate; only 4 percent paid the market rate for parking. In Southern California, a 1988 survey found that 91 percent of employees park free at work in Los Angeles, Riverside, San Bernardino, and Ventura Counties (Commuter Transportation Services, Inc., 1988). Finally, the Regulation XV trip reduction plans submitted to the South Coast Air Quality Management District provide powerful new evidence on the firmly entrenched nature of employer-paid parking. The SCAQMD's much praised Regulation XV requires all employers with 100 or more employees at a work site to implement a trip reduction plan designed to increase the average vehicle ridership for their employees' commute trips. Each firm's trip reduction plan must include an array of ridesharing incentives (such as transit passes, vanpool subsidies, rideshare matching) and solo driving disincentives (such as charging for parking). Approximately 9,000 firms are subject to Regulation XV, which is the first regional ridesharing regulation of its kind in the nation. Surprisingly, 97 percent of the firms that submitted their first-year plans to the SCAQMD in 1991 reported that they offer free parking to all employees as part of their trip reduction plan. ¹

III. EMPLOYER-PAID PARKING INCREASES SOLO DRIVING

One way to illustrate how parking subsidies strongly influence travel cost is to compare the average parking subsidy to a hypothetical congestion toll. For commuters who received employer-paid parking in downtown Los Angeles in 1986, the average round trip commute length was 36 miles, while the average parking subsidy was \$3.87 per day (Shoup and Willson, 1992). If the average round trip drive to work is 36 miles, and the average parking subsidy is \$3.87 per day, the average parking subsidy is equivalent to 11 cents per vehicle mile travelled. Thus, imposing a congestion toll of 11 cents per mile travelled would raise the cost of driving to the Los Angeles CBD by only as much as employer-paid parking already lowers it. And employers fully subsidized parking for almost half of all the solo drivers to downtown Los Angeles.

1. There is, however, a ray of hope in the data. Only 92 percent of the firms that have submitted their second-year plans report that they offer free parking to all employees. See Lopez-Aqueres and Wasikowski (1992).

Because the subsidies are so substantial, employer-paid parking substantially increases the amount of solo driving to work. Table I summarizes the results from the existing well-documented case studies of how employer-paid parking affects commuters' travel choices. These case studies have either: (1) compared the commuting behavior of employees *before* and *after* employer-paid parking was eliminated; or (2) compared the commuting behavior of matched samples of employees *with* and *without* employer-paid parking. Willson and Shoup (1990b) summarize these cases, covering a variety of locations, and employer and employee types.

Table 1 first shows the effect of employer-paid parking in terms of solo driver mode share, and reveals that offering employer-paid parking shifted between 7 and 44 percent of commuters to solo driving from other modes, and on average shifted about one-fourth of commuters to solo driving. Second, the table shows that employer-paid parking increased the number of cars driven to work by between 7 and 28 cars per 100 employees, with an average increase of 19 cars per 100 employees. Finally, the last column of Table 1 standardizes the results of the case studies in terms of the price elasticity of demand for parking. The price elasticity of demand ranges from -0.08 to -0.23, with an average of -0.16, which can be interpreted as meaning that a 10 percent increase in the price of parking will reduce the number of cars driven to work by 1.6 percent.

The previous studies summarized in Table 1 have focussed on estimating how employer-paid parking increases solo driving. The purpose of the research reported here is to go beyond these previous studies to discover how employer-paid parking affects more fundamental measures of transportation system performance, such as vehicle miles travelled to work, energy consumed by automobile commuting, and total spending on both parking and automobile commuting. Further, we will try to estimate how reducing employer-paid parking subsidies will reduce the cost of transportation, so that we can compare the possible contributions of parking pricing and congestion pricing to improving the performance of the transportation system.

IV. EMPLOYER-PAID PARKING IS A MATCHING GRANT

If an employer offers free parking at work, the employee must still pay all the rest of the cost of driving to work. This employer-paid parking arrangement is essentially a type of matching grant, where the employer pays part of the cost of commuting by car (the parking cost) if the employee is able and willing to pay the rest of the cost of commuting by car (the driving cost). Employees who are unable or unwilling to commute by car are unable to take advantage of the

TABLE 1

HOW EMPLOYER-PAID PARKING STIMULATES SOLO DRIVING

Case Study and Type	Solo Driver Mode Share			Autos Driven per 100 Employees			Price Elasticity of Demand
	Driver Pays for Parking	Employer Pays for Parking	Difference in Solo Share	Driver Pays for Parking	Employer Pays for Parking	Difference in Auto Trips	
Mid-Wilshire, Los Angeles (before/after)	8%	42%	+34%	30	48	+18	-0.23
Warner Center, Los Angeles (before/after)	46%	90%	+44%	64	92	+28	-0.18
Century City, Los Angeles (with/without)	75%	92%	+17%	80	94	+14	-0.08
Civic Center, Los Angeles (with/without)	40%	72%	+32%	50	78	+28	-0.22
Downtown Ottawa, Canada (before/after)	28%	35%	+7%	32	39	+7	-0.10
AVERAGE OF CASE STUDIES	39%	66%	+27%	51	70	+19	-0.16

Source: Adapted from Shoup and Willson (1992)

parking subsidy. Thus, the effects of an employer's offer of free parking can be analyzed in the same way as the effects of a matching grant are traditionally analyzed.

Matching grants are usually offered in order to stimulate a desired response by the recipient. For example, some employers offer to contribute \$1 to an employee's tax-deferred pension plan for every \$1 the employee also contributes. The rationale for this matching grant is that by increasing the value of the employee's own contribution, it will *stimulate* the desired response of additional retirement saving by the employee. But the employer's contribution can also serve to *replace* some of the retirement saving that the employee would need to make to achieve a specific retirement savings goal. If employees respond to the dollar-for-dollar matching grant with a 50 percent reduction in their own existing contributions to the pension plan, the employer's matching contribution does not *stimulate* any additional saving; rather, it merely *replaces* saving the employee would have done even without the matching contribution. To take another example, some employers offer to match their employees' donations to designated charities. The rationale for this matching offer is that it will *stimulate* additional charitable donations by the employee, rather than *replace* charitable donations that the employee would have made anyway. The relative sizes of the stimulus and replacement effects of a matching grant are often hard to measure, but the intent of any matching grant is almost always to stimulate desired behavior by employees rather than simply to shift the burden of payment from the employee to the employer.

In the case of employer-paid parking, however, the unstated assumption is that, for most employees, an employer's payment for parking will simply replace a payment for parking that the employee would have made anyway. But for some employees, the employer's offer to pay for parking will stimulate a mode shift (say from mass transit to solo driving), because the employee will pay all the rest of the cost of driving to work *only* if the employer pays for the parking. If it can be shown that employer-paid parking significantly *stimulates* solo driving to work (and therefore total expenditures on commuting) rather than simply *replaces* payments for parking that drivers would have made anyway, would it seem reasonable and prudent for employers to subsidize employee *commuting* by subsidizing employee *parking*?

When employer-paid parking is viewed as a matching grant -- the employer pays the cost of parking if the employee pays all the rest of the cost of driving to work -- the question then arises: to what extent does employer-paid parking *replace* payments for parking that employees would have made anyway, and to what extent does employer-paid parking *stimulate* an increase in the number

of parking spaces demanded by employees? The next section attempts to answer this question for commuters to the Los Angeles CBD, and then goes on to estimate the extent to which employer-paid parking also stimulates increases in (1) the number of vehicle miles travelled to work by commuters, (2) the amount of gasoline consumed by this commuting, and (3) the total expenditure on automobile commuting.

V. EMPLOYER-PAID PARKING STIMULATES PARKING DEMAND

Previous research has focussed on discovering how employer-paid parking increases solo driving, but has not gone on to measure the resulting increases in vehicle miles travelled, gasoline consumption, and total spending on transportation. To go beyond the simple measure of mode choice to these other more fundamental measures of transportation system performance, it is first necessary to have data not only on how employer-paid parking influences the mode choice of each commuter, but also on the distance travelled to work by each commuter. Fortunately, these additional data are available in the most recent transportation survey of commuters to downtown Los Angeles, which collected data from 5,060 employees working for 118 employers; the statistical sample was designed to accurately represent the entire population of office workers in downtown Los Angeles.² Because the survey included data on both employers' parking subsidies and their employees' travel behavior and socioeconomic characteristics, we are able to use these data to estimate how employer-paid parking alters employees' travel choices.

We have used employers' responses regarding their parking policy to select two subsamples of employees: the first is all those commuters whose employers do not subsidize any employee parking, and the second is all those whose employers offer free parking to all employees. These subsamples were then used to estimate a logit model of commuter mode choice, with employer-paid parking included as an independent variable along with the other more customary variables such as income, occupation, and travel time and travel cost to work by each mode.³ We have used this logit

2. The *Los Angeles CBD Employee-Employer Baseline Travel Survey*, was undertaken by the Community Redevelopment Agency of the City of Los Angeles in 1986. See Willson and Shoup (1990b) for a full description of the survey.

3. See Willson (1991) and Shoup and Willson (1992) for more detail on the estimation of this logit model.

model to predict how the offer of employer-paid parking affects the travel choices of free parkers in downtown Los Angeles, and Table 2 displays the results.⁴

The first row of the table reveals a striking difference in travel choices between those who pay to park and those who park free: only 48 percent drive to work alone if they pay to park, while 69 percent drive alone if they park free. Because the model takes into account differences in socioeconomic characteristics and travel costs by different modes, it can be inferred that in this sample of downtown office workers the offer of employer-paid parking stimulates a 44 percent increase in the number of solo drivers.

Because some employees respond to employer-paid parking by shifting from carpools to solo driving, these mode shifting employees increase the number of parking spaces they occupy by less than they increase the number of solo drivers: those who pay to park occupy 0.56 parking spaces per employee, while those who park free occupy 0.75 parking spaces per employee, a 34 percent increase in parking demanded.⁵ Given the average cost of commuter parking in downtown Los Angeles of \$83.82 per month, the third row of Table 2 shows that commuters who must pay to park if they drive to work spend an average of \$563 per employee per year for parking. If the employer offers to pay for parking, the employer spends an average of \$750 per employee per year for parking.⁶ Thus, the offer of employer-paid parking stimulates a 34 percent increase in spending for parking, because 34 percent more commuters demand parking at the zero price than at the market

4. The logit model was initially estimated with data on both those who pay to park and those who park free. The model was then used to predict the mode choices of all commuters in the subsample who park free. Thus, it predicts how those who are now offered employer-paid parking would have behaved if they had not been offered employer-paid parking. A simple comparison of mode choice between the subsample who paid to park and the subsample who parked free, without using any statistical control to account for the effect of other variables, produced very similar results.

5. The number of cars driven to work per employee is calculated by adding together (1) the number of solo drivers, and (2) the number of carpools divided by the reported average carpool occupancy of 2.92 persons per vehicle. This sum of vehicles driven to work is then divided by the total number of employees (*including mass transit riders*) to yield the number of cars driven to work per employee.

6. Note that the *per-employee* spending for parking is the total spending on parking for *all* employees (including transit users and carpools) divided by the total number of these employees.

TABLE 2

TRAVEL BEHAVIOR AND TRAVEL EXPENDITURES OF COMMUTERS
TO THE LOS ANGELES CENTRAL BUSINESS DISTRICT

<u>Travel Behavior or Travel Expenditure</u>	<u>Driver Pays for Parking</u>	<u>Employer Pays for Parking</u>	<u>Stimulated Increase</u>	<u>Percent Increase</u>
1. Solo Driver Share	48%	69%	21%	44%
2. Parking Spaces Occupied (per Employee)	0.56	0.75	0.19	34%
3. Parking Expenditure (per Employee per Year)	\$563	\$750	\$187	34%
4. Vehicle Miles Travelled (per Employee per Day)	18.1	24.1	6.0	33%
5. Vehicle Miles Travelled (per Employee per Year)	3,919	5,230	1,311	33%
6. Gasoline Consumed (Gallons per Employee per Year)	231	308	77	33%
7. Auto Use Expenditure (per Employee per Year)	\$1,137	\$1,517	\$380	33%
8. Parking + Auto Use Expenditure (per Employee per Year)	\$1,700	\$2,266	\$566	33%
Assumptions:				
Days Worked per Year	217			
Auto Fuel Efficiency (MPG)	17			
Auto Use Cost (\$/Mile)	\$0.29			
Cost of Parking (\$/Month)	\$83.82			

price. Therefore, on average, employer-paid parking *replaces* \$563 per employee per year that the employees would have spent, and *stimulates* additional spending of \$187 per employee per year; the employer pays the sum of \$750 per employee per year for both the replaced (\$563) and the stimulated (\$187) spending on commuter parking.

VI. EMPLOYER-PAID PARKING STIMULATES ADDITIONAL VEHICLE MILES OF TRAVEL

We have data on the distance travelled to work by each commuter in the sample, so we can go beyond the simple comparison of mode split and parking demand to examine more fully how employer-paid parking affects employees' travel demand and total travel cost. Because some employees respond to employer-paid parking by shifting from carpools and mass transit to solo driving, these mode-shifting employees increase the number of automobile vehicle miles travelled (VMT) to and from work. The fourth row of Table 2 shows that, on average, commuters who must pay to park create only 18.1 VMT per day. Employer-paid parking stimulates a 33 percent increase in vehicle use to 24.1 VMT per day.⁷ Thus, employer-paid parking stimulates an extra 6 VMT per day per employee because so many more of the commuters who can park free *at* work respond by driving *to* work. Row 5 of Table 2 shows that, on average, offering employees free parking at work in the Los Angeles CBD creates an additional 1,311 VMT per employee per year, almost all of which are added at peak hours on heavily congested routes.⁸

7. Employer-paid parking stimulates a slightly smaller increase in VMT than in parking demand because the offer of free parking induces more commuters with short travel distances to shift to solo driving, presumably because parking costs are a larger share of total travel costs for shorter trips.

8. The VMT of employees in each category (pay parking and free parking) is calculated by summing (1) the round trip distance of solo drivers and (2) the round trip distance of carpools, divided by the reported average carpool occupancy of 2.92 passengers per vehicle. This total VMT of solo drivers and carpools in each category (pay and free) is then divided by the total number of employees, including transit users, in that category, to yield the VMT per employee per day. This measure therefore refers to vehicle miles travelled by automobiles, and excludes passenger-miles travelled on mass transit. To measure the distance travelled by each solo driver we use the average reported distance for all solo drivers from the same zip code of residence, and for each carpooler we use the average trip distance reported by all carpoolers from the same zip code. Because carpoolers reported a greater average travel distance to work than solo drivers from the same zip code, our procedure takes into account that shifting from solo driving to carpooling can increase the distance travelled to work. The average round trip distance to work

VII. EMPLOYER-PAID PARKING STIMULATES GASOLINE CONSUMPTION

There are numerous harmful consequences of increased VMT. For example, the additional VMT stimulated by employer-paid parking increases gasoline consumption. The California Air Resources Board estimated that the average automobile fuel efficiency in Southern California was 17.0 miles per gallon in 1987. Given this average fuel efficiency, Row 6 of Table 2 shows that when commuters pay for their own parking, they use an average of 231 gallons of gasoline for driving to work. Employer-paid parking stimulates a 33 percent increase in gasoline consumption to 308 gallons per year. That is, on average, commuters respond to the offer of free parking by driving 1,311 more vehicle miles, and this additional driving consumes an additional 77 gallons of gasoline per employee per year.⁹

VIII. EMPLOYER-PAID PARKING INCREASES SPENDING ON TRANSPORTATION

The figures for the additional annual VMT stimulated by employer-paid parking can also be used to estimate the additional annual cost of automobile use stimulated by employer-paid parking. The U. S. Department of Transportation estimated that in 1986 the average cost of using an automobile was 29 cents per mile of travel, including depreciation, insurance, and operating cost. Given this cost per mile of travel, Row 7 of Table 2 shows that when commuters must pay to park, the average expenditure for automobile commuting is \$1,137 per year. Employer-paid parking stimulates a 33 percent increase in average automobile commuting expenditure to \$1,517 per year. That is, on average, commuters respond to free parking by spending \$380 per year more on driving to work. Note that when an employer pays for employee parking, the employee saves \$563 on parking, but spends \$380 more on driving (because of the higher solo share), and therefore saves only \$183 per year on the total cost of parking and driving. Therefore, despite the employer's spending an average of \$750 per employee per year for parking subsidies (\$563 in replaced employee spending, and \$187 in stimulated spending), the employees' own total spending for parking and driving declines by only \$183 per year. *The net effect is that the employer must spend \$4.10 on parking subsidies for every \$1 the employee saves on the cost of parking and driving.* This surprising disproportion between the large amount employers pay and the small amount employees

for all commuters in the sample is 36 miles.

9. Note that this represents 77 extra gallons of gasoline used *per employee who is offered free parking*, not just per employee who drives to work.

save is explained by employer-paid parking's strong stimulus to spending on both parking and driving: the stimulus to parking demand inflates what employers have to pay, and the stimulus to driving diminishes what the employees save.¹⁰

Finally, we can estimate the effect of employer-paid parking on the total spending (by employers *and* employees) for both parking and driving. Employer-paid parking increases spending per employee on parking by \$187 per year, and increases spending per employee on driving by \$380 per year. Thus, Row 8 of Table 2 shows that the offer of employer-paid parking stimulates, on average, additional spending of \$566 per employee per year for parking and driving. That is, shifting the responsibility of paying for parking at work from the driver to the employer stimulates a 33 percent increase in total spending for parking *and* driving. Figure 1 shows the same data in graphic form.

Finally, note that employer-paid parking *replaces* \$563 per year in payments that employees would have paid for parking, and *stimulates* an additional \$566 per year in spending for parking and driving. Therefore, employer-paid parking stimulates an extra dollar of total spending on parking *and* driving (by employers *and* employees) for every dollar of payment for parking it shifts from the employee to the employer.

To summarize the data in Figure 1 and Table 2, employer-paid parking in downtown Los Angeles:

- ⊗ increases the number of solo drivers by 44 percent
- ⊗ increases parking demand by 34 percent.
- ⊗ increases automobile vehicle miles travelled to work by 33 percent.
- ⊗ increases gasoline consumed for driving to work by 33 percent.
- ⊗ increases the cost of automobile travel to work by 33 percent.
- ⊗ increases the total cost of parking *and* driving by 33 percent.

IX. ADDING UP THE PRIVATE COSTS OF EMPLOYER-PAID PARKING

These numbers are estimates of how employer-paid parking increases the average cost *per employee* for automobile commuting to the Los Angeles CBD. But to understand the magnitude of

10. Note that these calculations explicitly focus on the cost of parking and driving, and do not purport to measure all the benefits and costs of commuting. We do, however, return to this issue later.

Figure 1

Annual Parking and Automobile Use Cost for Commuters to Downtown Los Angeles

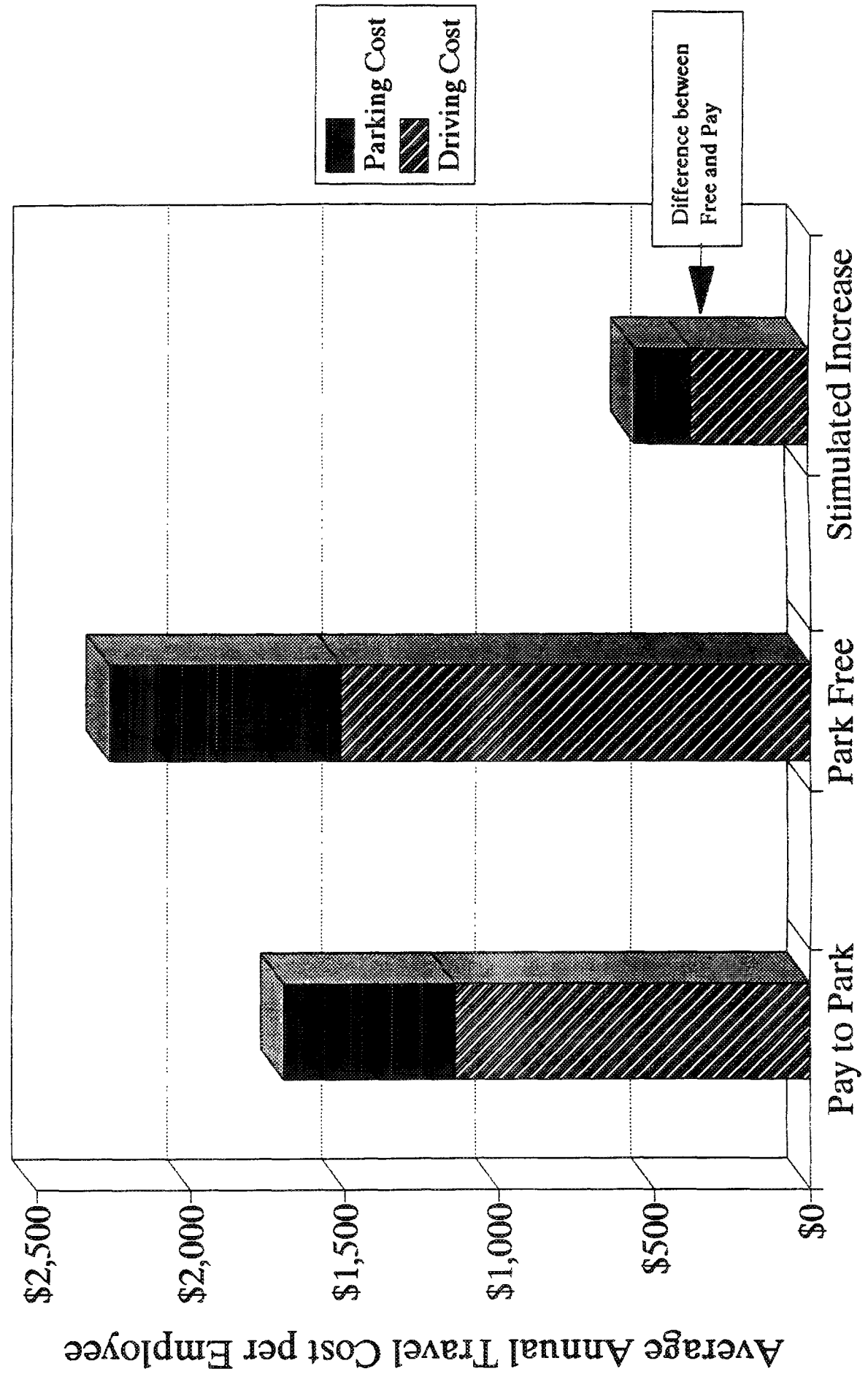


TABLE 3

ESTIMATED INCREASES IN TRAVEL COST CAUSED BY EMPLOYER-PAID PARKING
IN THE LOS ANGELES CENTRAL BUSINESS DISTRICT

Travel Behavior or Travel Expenditure (Total per Year)	Driver Pays for Parking	Employer Pays for Parking	Stimulated Increase	Percent Increase
1. Parking Spaces Occupied	39,000	52,000	13,000	34%
2. Total Parking Expenditure	\$39,228,000	\$52,304,000	\$13,076,000	34%
3. Vehicle Miles Travelled	272,406,000	363,480,000	91,074,000	33%
4. Gallons of Gasoline Consumed	16,055,000	21,407,000	5,352,000	33%
5. Auto Use Expenditure	\$78,998,000	\$105,409,000	\$26,411,000	33%
9. Parking + Auto Use Expenditure	\$118,226,000	\$157,713,000	\$39,487,000	33%

Assumptions:

Days Worked per Year	217
Auto Fuel Efficiency (MPG)	17
Auto Use Cost (\$/Mile)	\$0.29
Cost of Parking (\$/Month)	\$83.82
Number Offered Free Parking	69,503

the problems created by employer-paid parking, and to put them into perspective, it is necessary to estimate how employer-paid parking increases the *total* cost of travel by all commuters.

The total cost of employer-paid parking depends on how many employees are offered it. Therefore, to translate the previous estimates of the average cost *per employee* into an estimate of the *total* costs for all employer-paid parking, we first need an estimate of how many employees are offered free parking in the CBD. The *Baseline Survey* found that there were 173,283 office worker commuters to the CBD, and that there were 114,372 cars driven to work. Employers paid all of the cost of parking for 54,212 of these cars driven to work. Because there are 54,212 cars driven to work by those who park free, and because there are 0.78 cars driven to work per employee who is offered free parking, we can estimate that there are 69,503 employees (or 40 percent of all employees) who are offered free parking in downtown Los Angeles. Therefore, on the assumption that other commuters who are offered employer-paid parking respond in the same way as the commuters in the *Baseline* sample, we can examine the changes in the commuting behavior, and the related changes in the total cost of parking and driving, associated with the offer of free parking to these 69,503 employees.

Table 3 shows estimates that are parallel to Table 2, except that where Table 2 refers to estimates *per-employee*, Table 3 refers to the equivalent *aggregate* figures for all 69,503 employees who are offered employer-paid parking in the Los Angeles CBD. The first row of the table shows that employer-paid parking stimulates a 34 percent increase in the number of parking spaces occupied by these commuters, or 13,000 extra parking spaces used. By comparison, there are about 125,000 off-street parking spaces in all of downtown Los Angeles. Therefore, the employer-paid parking that is offered to 40 percent of commuters to downtown Los Angeles stimulates approximately an 10 percent increase in the total number of parking spaces demanded in downtown Los Angeles.

Because of the large shift toward solo driving, employer-paid parking stimulates commuters to drive 420,000 extra VMT per day, or 91 million extra VMT per year, almost all of it at peak hours. To put this extra VMT in perspective, the estimated travel by all passenger cars in the 6,600 square mile South Coast Air Basin was 173 million VMT per day in 1986.¹¹ Thus, employer-paid parking in the Los Angeles CBD alone stimulates additional vehicle travel in a year approximately

11.. California Air Resources Board, *Methodology to Calculate Emission Factors for On-Road Motor Vehicles*, July 1991.

equal to 53 percent of a day's total vehicle miles travelled by all passenger cars in the entire South Coast Air Basin.

At the average fuel efficiency of 17 miles per gallon, these extra VMT stimulated by employer-paid parking consume 5.3 million extra gallons of gasoline per year. To put this added gasoline stimulated by employer-paid parking into perspective, the estimated average fuel consumption per passenger car in the United States in 1986 was 526 gallons per year (MVMA, 1990, p. 51). Thus the *additional* fuel consumption stimulated by employer-paid parking in the Los Angeles CBD alone was approximately equal to the *total* annual fuel consumption of 10,077 additional automobiles.

The amount that employers spend on parking subsidies dwarfs the amount that employees save on the cost of parking *and* driving. Employers spend approximately \$52 million per year on parking subsidies, of which \$39 million replaces employees' own spending and \$13 million represents stimulated spending. This parking subsidy also stimulates a \$26 million per year increase in employees' spending for automobile commuting. Therefore, although employers' spend \$52 million per year on parking subsidies, their employees save only \$13 million per year on the cost of parking *and* driving, compared to what they would have spent on parking and driving in the absence of employer-paid parking. Again, the explanation for this striking disparity between the employers' large cost and the employees' small saving is that employer-paid parking so strongly stimulates spending on both parking (paid by the employer) and driving (paid by the employee).

Finally, the last row of Table 3 shows that employer-paid parking stimulates an extra \$39 million per year in total spending for parking in and driving to downtown Los Angeles. Note that this \$39 million in extra spending for parking and driving stimulated by employer-paid parking equals the \$39 million in employees' payments for parking that employer-paid parking replaces. Therefore, every dollar of spending for parking that employer-paid parking shifts from the employee to the employer stimulates a one dollar increase in total spending for parking *and* driving.

To summarize the data in Table 3, employer-paid parking in downtown Los Angeles:

- ☉ replaces \$39 million per year that commuters would have paid for parking.
- ⊗ stimulates a "need" for 13,000 additional parking spaces.
- ⊗ stimulates an additional \$13 million per year in spending for parking.
- ⊗ stimulates an additional 91 million vehicle miles travelled per year for driving to work.

- ⊗ stimulates an additional 5.3 million gallons of gasoline consumed per year for driving to work.
- ⊗ stimulates an additional \$26 million per year in spending on driving to work.
- ⊗ stimulates an additional \$39 million per year in total spending for parking *and* driving.

X. ADDING UP THE SOCIAL COSTS OF EMPLOYER-PAID PARKING

These increased costs of parking and driving stimulated by employer-paid parking are only the *private* costs paid by commuters and by their employers. But because employer-paid parking so greatly increases VMT, it also increases the *external* costs of automobile travel, such as air pollution and traffic congestion, which are not included in the previous calculations. Measuring external costs is more difficult than measuring private costs, but there have been numerous attempts to estimate the external costs of urban automobile use, and we will draw on these previous estimates to give a rough figure for the external costs stimulated by employer-paid parking.

Traffic congestion is a major external cost of increased solo driving, because when one more car uses a roadway that is already near capacity, that additional car slows down all the other cars (and buses) already on the road. Slowing down these other vehicles increases total travel time, and this increased travel time for all other roadway users (including mass transit passengers) is an external cost of auto use that is not borne the additional driver additional driver deciding to use the road. There are a variety of ways to estimate the cost of road congestion, usually based on the value of time lost in congested traffic or the cost of additional roadway capacity required. Lee (1989) and Morrison (1986) have summarized a number of attempts to estimate the congestion-related external costs of automobile use in peak periods; those estimates range from 1 cent to 38 cents per mile travelled, depending on the conditions and estimation method. DeCorla-Souza and Kane (1991) estimate that cost of new highway capacity to serve peak users in Los Angeles is 19.8 cents per peak period mile. Cameron (1991) provides additional estimates for Los Angeles ranging between 10 cents and 37 cents per mile. Because the routes leading to the Los Angeles CBD are among the most congested in Southern California, 20 cents per vehicle mile of travel seems a conservative estimate of the external congestion cost imposed by additional peak hour commute travel to downtown Los Angeles, and we have used this figure in Table 4 to estimate the congestion costs stimulated by employer-paid parking in downtown Los Angeles.

The first row of Table 4 shows the VMT per employee per day for those who pay to park and those who park free, and the second row shows the congestion cost imposed by this travel if the

TABLE 4

THE SOCIAL COSTS PER EMPLOYEE OF EMPLOYER-PAID PARKING
IN THE LOS ANGELES CENTRAL BUSINESS DISTRICT

<u>Travel Behavior or Travel Expenditure (per Employee per Year)</u>	<u>Driver Pays for Parking</u>	<u>Employer Pays for Parking</u>	<u>Stimulated Increase</u>	<u>Percent Increase</u>
1. Vehicle Miles Travelled	3,919	5,230	1,311	33%
2. Congestion Cost Imposed	\$784	\$1,046	\$262	33%
3. Pollution Cost Imposed	\$157	\$209	\$52	33%
4. External Cost Imposed (Congestion + Pollution)	\$941	\$1,255	\$315	33%
5. Private Cost of Auto Use (Driving + Parking)	\$1,700	\$2,266	\$566	33%
6. Total Social Cost of Auto Use (Private + External)	\$2,641	\$3,521	\$881	33%

Assumptions:

Days Worked per Year	217
Fuel Efficiency (MPG)	17
Auto Use Cost (\$/Mile)	\$0.29
Cost of Parking (\$/Month)	\$83.82
Congestion Cost (\$/mile)	\$0.20
Pollution Cost (\$/mile)	\$0.04

congestion cost is 20 cents per mile. On average, those who pay to park impose a congestion cost of \$784 per year on other travellers, and those who park free impose a congestion cost of \$1,046 per year. Therefore, employer-paid parking raises this congestion cost by \$262 per year per employee to whom it is offered.

Estimates of the other significant external cost of automobile use, air pollution, also vary widely. One technique of estimating this external cost is to estimate the value of the damage done by all air pollution, identify that portion related to transportation, and divide that damage by the number of automobile trips. Cameron (1991) estimated a cost of 46 cents *per trip* using this methodology. An alternative technique is to calculate a per mile cost of pollution by valuing it at the costs borne by stationary sources to reduce a unit of pollution. This technique produced a 4 cent *per mile* estimate (Cameron 1991). We use this estimate of 4 cents per mile for the present purpose of calculating the pollution cost of automobile commuting to downtown Los Angeles, and Row 3 of Table 4 shows these costs. On average, those who pay to park impose an air pollution cost of \$157 per year, and those who park free impose a pollution cost of \$209 per year. Therefore, employer-paid parking stimulates an increase of \$52 per year in pollution cost for every employee to whom it is offered.

The sum of the external costs of congestion and pollution stimulated by employer-paid parking is \$315 per year for every employee who is offered free parking (see Row 4). This compares to the additional private costs of parking and driving of \$380 per year for every employee who is offered free parking. That is, the external costs add another 83 percent to the private costs stimulated by employer-paid parking, and, on average, the total additional cost (private plus external) of automobile use stimulated by employer-paid parking is \$695 per year for every employee who is offered free parking.

The figures in Table 4 refer to the average *per-employee* private and external costs of automobile commuting to downtown Los Angeles. We can now translate these per-employee costs into a rough estimate of the total private and external costs caused by the offer of employer-paid parking to the approximately 69,500 office workers to whom it is offered in downtown Los Angeles. Table 5 shows estimates that are parallel to Table 4, except that where Table 4 refers to average costs per employee, Table 5 refers to the equivalent aggregate estimates for all 69,500 employees who are offered free parking in the CBD. Row 2 of the table shows that employer-paid parking stimulates an additional congestion cost, borne by other motorists, of \$18 million per year.

TABLE 5

TOTAL SOCIAL COST OF EMPLOYER-PAID PARKING
IN THE LOS ANGELES CENTRAL BUSINESS DISTRICT

<u>Travel Behavior or Travel Expenditure (Total per Year)</u>	<u>Driver Pays for Parking</u>	<u>Employer Pays for Parking</u>	<u>Stimulated Increase</u>	<u>Percent Increase</u>
1. Vehicle Miles Travelled	272,406,000	363,480,000	91,074,000	33%
2. Congestion Cost Imposed	\$54,481,000	\$72,696,000	\$18,215,000	33%
3. Pollution Cost Imposed	\$10,896,000	\$14,539,000	\$3,643,000	33%
4. External Cost Imposed (Congestion + Pollution)	\$65,377,000	\$87,235,000	\$21,858,000	33%
5. Private Cost of Auto Use (Driving + Parking)	\$118,226,000	\$157,713,000	\$39,487,000	33%
6. Total Social Cost of Auto Use (Private + External)	\$183,603,000	\$244,948,000	\$61,345,000	33%

Assumptions:

Days Worked per Year	217
Fuel Efficiency (MPG)	17
Auto Use Cost (\$/Mile)	\$0.29
Cost of Parking (\$/Month)	\$83.82
Congestion Cost (\$/mile)	\$0.20
Pollution Cost (\$/mile)	\$0.04
Number Offered Free Parking	69,503

Similarly, Row 3 shows that employer-paid parking stimulates an additional air pollution cost, borne by all residents of the South Coast Air Basin, of \$3.6 million per year. Thus, the cost of additional congestion is approximately five times greater than the costs of additional air pollution. The sum of this added external cost of congestion and pollution stimulated by the free parking offered to commuters to downtown Los Angeles is approximately \$22 million per year. Finally, the sum of these estimated private *plus* external costs stimulated by employer-paid parking in downtown Los Angeles is approximately \$61 million per year. Figure 2 presents these data in graphic form.

To summarize the data in Table 5 and Figure 2, employer-paid parking in downtown Los Angeles:

- ⊗ stimulates an additional \$18 million per year in congestion costs.
- ⊗ stimulates an additional \$3.6 million per year in pollution costs.
- ⊗ stimulates an additional \$39 million per year in private spending on auto use.
- ⊗ stimulates an additional \$61 million per year in the total social costs of automobile commuting.

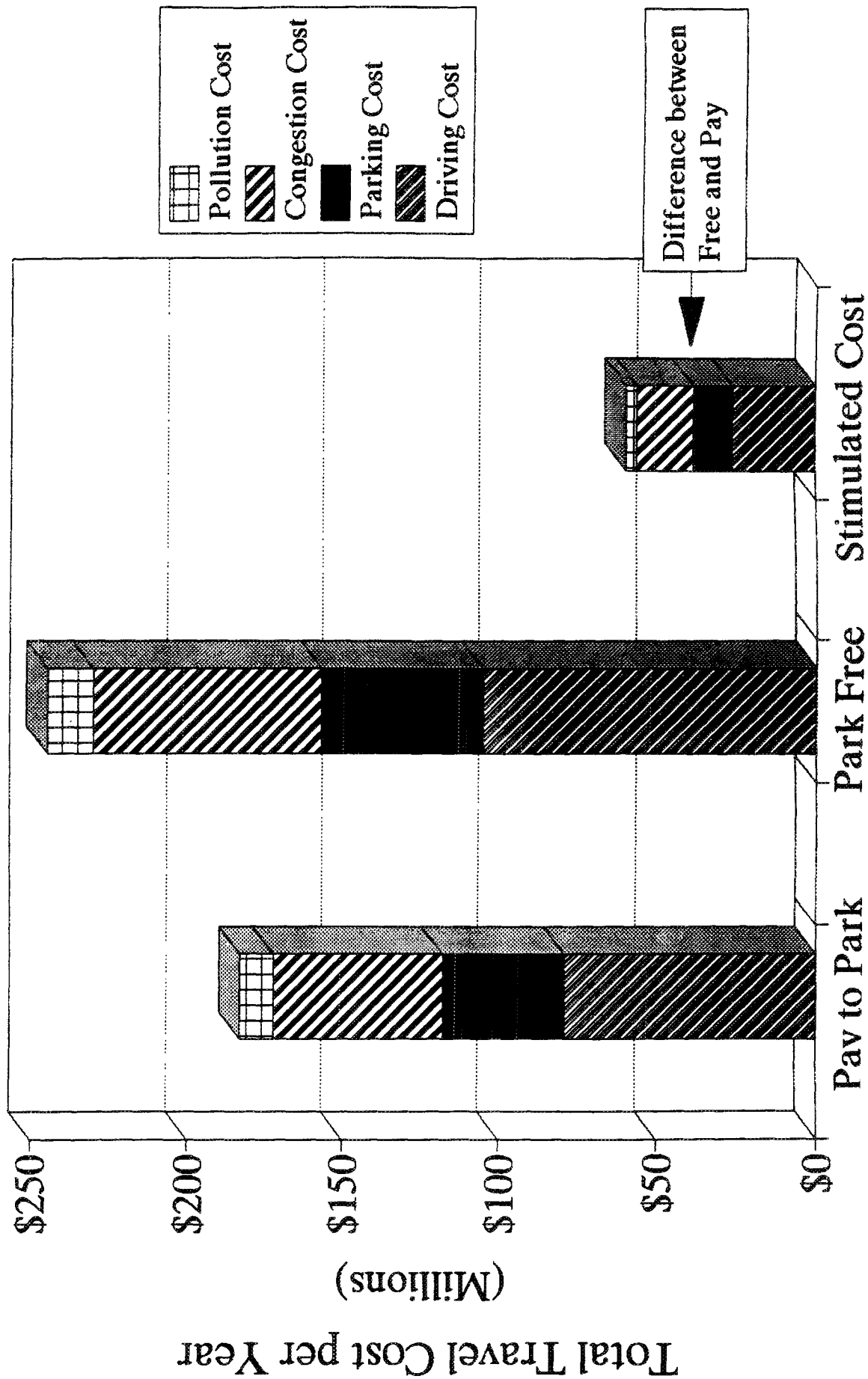
In addition to the social costs just estimated, there are a wide variety of other social costs for which per mile estimates are not readily available. For example road use causes unpriced losses to property value related to the noise, aesthetic degradation, and neighborhood disruption. Road use also causes unpriced road maintenance and operation costs, because gasoline taxes and vehicle fees do not cover the full cost of operating the automobile transportation system (Pucher, 1988). In addition to the time delay costs of congestion, there is increasing recognition of stress costs, although quantitative estimates are not available (Novaco, 1990). There are also significant costs of accidents not covered by automobile insurance, including medical costs that are paid by health insurers rather than automobile insurers. In addition to the direct health and property damage consequences of air pollution, there are uncertain and unmeasured potential costs relating to the automobile's contribution to global warming. Finally, there are a number of other potential costs, such as dependence on foreign sources of energy, associated with the use of gasoline. Thus, there is every reason to believe that the figures in Table 5 underestimate the additional external costs of automobile use stimulated by employer-paid parking in downtown Los Angeles.

XI. EMPLOYER-PAID PARKING IS A DELIBERATE PUBLIC POLICY

In offering to pay for their employees' parking at work, employers are simply doing what the Internal Revenue Code's so-called "special rule for parking" tells them to do. Paragraph (4) of

Figure 2

The Social Costs of Automobile Travel For Commuters to Downtown Los Angeles



section 132(h) of the Internal Revenue Code of 1986 is the special rule for parking, which in its entirety states that:

The term "working condition fringe" includes parking provided to an employee on or near the business premises of the employer.

Why does the Code have this special rule defining employer-paid parking as a "working condition fringe?" The Code's general definition of a "working condition fringe," which is exempt from income taxation, is any item provided to an employee that would be tax deductible by the employee if the employee paid for it. If, for example, the employer provides the employee a work uniform the cost of which the employee would be able to deduct if the employee paid for it, the employer does not report the value of the uniform as taxable income to the employee. But if, to take a different example, the employer provides the employee a car the cost of which the employee would *not* be able to deduct if the employee paid for it, the car does *not* fit the definition of a tax-exempt working condition fringe, and the employer must report the imputed market value of the car as taxable income to the employee. Because an employee can *not* deduct his or her own payment for parking at work, employer-paid parking does *not* fit the general definition of a tax-exempt working condition fringe benefit. Therefore, in order to exempt employer-paid parking from income taxation, the special rule for parking was necessary to classify employer-paid parking as a working condition fringe, contrary to general rule for all other working condition fringe benefits. Further, the special rule for parking is the sole exception to the general rule for working condition fringes in the Code. Thus, the income tax exemption of employer-paid parking subsidies is a unique, deliberate, and specially targeted tax exemption that has the unfortunate, unintended effect of stimulating a huge increase in the number of commuters who drive alone to work.

Ridesharing and mass transit advocates have often complained about the tax bias in favor of employer-paid parking.¹² For example, elsewhere we have calculated that, for an employee whose taxable income is \$45,000 per year, an employer in California would have to pay the employee \$1.69 in taxable cash income to yield, after federal and state income and social security taxes, the after-tax equivalent of a \$1 tax-exempt parking subsidy (Shoup and Willson, 1992). Therefore, tax-exempt employer-paid parking is worth 69 percent more than a taxable cash commute allowance equal to the

12. See, for example, Shoup and Pickrell (1980) and Shoup (1982).

cost of a parking space at work. This "tax efficiency" strongly encourages employers to subsidize employee parking.

Although there is a growing body of evidence (summarized in Table 1 and extended in Tables 2 - 5) that employer-paid parking seriously aggravates traffic congestion and air pollution, and greatly stimulates gasoline consumption, it is politically very difficult to argue in favor of eliminating a long-standing and popular tax exemption that benefits so many workers, at all income levels. Therefore, it seems unrealistic, even quixotic, simply to recommend that employer-paid parking subsidies should be taxed as ordinary income. The intentional inclusion of the special rule for parking in the tax code is itself evidence of the political importance attached to the tax-exemption for employer-paid parking.

XII. REDUCING THE DISTORTIONS CAUSED BY THE TAX-EXEMPTION OF EMPLOYER-PAID PARKING

Given the political difficulty, perhaps even impossibility, of taxing employer-paid parking subsidies, is there any feasible way to reduce the damage caused by the existing tax incentive to offer employer-paid parking? We believe that there is, and that the way to do it is to give employers an incentive to offer their employees a commuting subsidy, rather than just a parking subsidy.¹³ To encourage employers to offer their employees the option to choose a cash commuting allowance as an alternative to a parking subsidy, we recommend amending the special rule for parking in Paragraph (4) of Section 132(h) as follows:

The term "working condition fringe" includes parking provided to an employee on or near the business premises of the employer *if the employer offers the employee the option to receive, in lieu of the parking, the fair market value of the parking subsidy, either as a taxable cash commute allowance or as a mass transit or ridesharing subsidy.*

The nonitalicized portion is the full text of the existing special rule for parking, *and the italicized portion is the proposed change.*

This proposed policy of requiring employers who offer an employee a parking subsidy also to offer that employee the option to choose the cash equivalent of the parking subsidy instead has, we believe, several important advantages:

13. See Shoup and Willson (1992) for a full explanation of our proposal. The following section is condensed from that source.

1. First, and politically very important, no employee would lose any existing parking subsidy as a result of this policy. Most proposals for using parking pricing to reduce solo driving presume a need to "cause discomfort" for solo drivers.¹⁴ But a cash option would not cause discomfort for any commuter. Instead, commuters would receive a new option, the cash alternative. Employers could continue to offer tax-exempt parking subsidies, so long as they broaden the offer to allow the employee the *option* to take the taxable cash value of the parking subsidy in lieu of the parking subsidy itself. Rather than restricting an employee's options, our proposed amendment *adds* a new option (the cash alternative) for many employees who now face a take-it-or-leave-it choice between a parking subsidy or nothing.

2. Second, offering commuters the option to choose between a free parking space and cash makes it clear that parking has an opportunity cost, which is the cash not taken. Therefore, many employees who are offered free parking at work would begin to behave as though they paid for parking, because the cash alternative foregone would be a "price" for taking the parking. The option of cash in lieu of a parking subsidy would most tempt those auto commuters who now receive employer-paid parking in locations where parking prices are highest. Because parking is usually most expensive in the most congested areas, the option to take cash instead of a parking subsidy would automatically target the incentive to stop driving to work alone exactly where this incentive is most needed. And because an employee can always use cash to pay for non-transportation expenses, the required offer of cash also rewards the most benign forms of commuting -- walking and cycling -- as alternatives to driving.

3. Third, employers are no worse off if an employee chooses the cash alternative and gives up the parking subsidy because the cash alternative is no more costly than the parking subsidy. Further, employers might be much more eager to offer the cash alternative if they know the tax code requires all similarly situated employers to make the same offer, so no employer, or location (such as the city center) would be put at any competitive disadvantage. Compared to other solutions to the employer-paid parking problem, the cash option requirement is least intrusive in the employer's decisions about employee compensation, requiring only that an employer not confine any commuting subsidy to parking alone. Few would argue that the Internal Revenue Code *should* encourage

14. For example, see Koppelman, Schofer, and Bhat (1991, p. I-3).

employers to confine their commuting subsidies to parking alone (and thus to employees who drive to work).

4. Fourth, another desirable feature of the required cash option is that the lowest paid workers would gain the most after-tax cash from a taxable cash allowance in lieu of employer-paid parking, because they are in the lowest tax brackets. Also, the cash allowance would be larger in proportion to a lower income, so the cash option would clearly improve the relative well-being of the lowest paid workers. This point responds to the traditional criticism that charging for parking is unfair because it would harm either low-income workers or those who need to drive to work because of family or personal circumstances.

5. Fifth, a simple way to implement and enforce the requirement to offer employees the option of taxable cash in lieu of a tax-exempt parking subsidy would be to require employers to report any tax-exempt parking subsidies on their employees' payroll forms in the same way they already report other tax-exempt fringe benefits (such as health care insurance). This reporting requirement would not only tell employees the amount of the cash alternative available to them in lieu of their parking subsidy, but would also provide previously unobtainable data on the extent of total employer-paid parking subsidies, both regionally and nationally. Further, the reporting requirement would make explicit - to employers, to employees, and to policy makers - what parking subsidies go to whom. This "daylight" feature might also focus serious attention on devising fairer and more efficient commuter travel subsidy policies.

6. Finally, when anyone voluntarily chooses taxable cash rather than a tax-exempt parking subsidy, *federal and state income tax revenues increase*. This increase in revenue does not result from any increase in tax rates, or from any taxation of previously tax-exempt parking subsidies, but rather it results from the voluntary cashing out of inefficient parking subsidies that are worth less to the employee than they cost the employer. The resulting federal and state income tax revenue bonus thus is funded solely by reducing the private waste initially induced by the special rule exempting parking subsidies from income taxation. This tax revenue bonus is an additional benefit above and beyond any reductions in air pollution, traffic congestion, and energy consumption that result when commuters choose taxable cash rather than a parking subsidy.

The research summarized in Table 1 and extended in Tables 2 - 5 clearly shows that the cost of parking, previously hidden from many commuters by parking subsidies, profoundly influences commuters' mode choices. The available option of cash in lieu of a parking subsidy would be a

strong incentive to rideshare, ride transit, bicycle, or walk to work. By allowing market prices to influence choices, a regulation requiring employers to offer employees the *option* of the equivalent cash value of any tax-exempt parking subsidy would reduce traffic congestion, air pollution, and gasoline consumption, and would increase federal and state income tax revenue. *It would do all this simply by allowing commuters to make travel choices in accord with their own preferences about how they wish to spend their own income.*

In making the choice between a parking subsidy or its cash equivalent, employees would, of course, have to consider that the cash is taxable, while the parking subsidy is not. Many employees, however, might still prefer the after-tax value of the cash alternative to an untaxed parking subsidy. For example, an employee who is offered the choice between the free use of a parking space that costs \$50 per month, or \$50 per month extra in taxable income, might well prefer to take the taxable income. For an employee with a taxable income of \$40,000 per year and in the 40% marginal tax bracket, the after-tax value of an extra \$50 per month in cash income is \$30 per month, which might be worth more to the employee than a parking space.

The taxability of a cash payment in lieu of a parking subsidy reduces, but by no means eliminates, the effectiveness of offering the cash alternative as an incentive to rideshare. The problem that cash is taxable but a parking subsidy is tax exempt is *not* an argument against the proposed requirement that employers who offer parking subsidies should also offer the cash alternative. If an employee freely chooses the taxable cash alternative because he or she feels that taxable income is worth more than a tax-exempt parking subsidy, how can anyone else argue that the employee is making the wrong choice? Indeed, if an employee does choose the taxable cash alternative, the choice proves beyond doubt that the parking subsidy is worth considerably less to the employee than it costs the employer, and is thus not only socially harmful but also privately wasteful.

Despite the advantages enumerated above, those who are particularly concerned with strengthening the competitive position of central business districts might question whether a seemingly impartial policy of requiring all employers to offer their employees the option to take cash in lieu of employer-paid parking might somehow put employers in central business districts at a relative disadvantage. Many downtown employers feel that they must offer their employees free parking because the higher cost of downtown parking would otherwise dissuade potential employees from choosing to work downtown. But we would argue that cashing out employer-paid parking

would make central cities relatively more, not less, attractive places to work and shop, compared to suburban locations, for several reasons.

First, employer-paid parking costs employers more in central than in suburban locations, so the cash that employers would be able to offer to downtown employees in lieu of a parking space would be higher than for suburban employees. This higher cash option for downtown employees would make downtown work sites relatively more attractive than suburban work sites. (By comparison, employer-paid parking without the cash option simply equalizes the cost of parking between downtown and suburban work sites, and does nothing to make a downtown location superior to a suburban location for workers.) Second, downtown work sites are more accessible by mass transit, so downtown employees would be better placed to take advantage of the cash option by shifting to mass transit. Similarly, downtown work sites are also more accessible by carpools because of the much greater density of potential fellow carpoolers, so downtown employees would also be better placed to take advantage of the cash option by shifting to carpools. Third, employees who prefer to take the cash and cease driving to work would reduce congestion on routes to downtown, so downtown work sites would become more accessible to everyone, including even those who continue to drive to work alone. Fourth, parking spaces vacated by peak hour commuters would become available to off-peak visitors, including shoppers, business clients, and tourists, who would therefore find downtown relatively easier to visit. For all these reasons, any fears that cashing out employer-paid parking would weaken the central business district seem quite misplaced.

XIII. HOW WOULD THE CASH OPTION REDUCE COMMUTER TRAVEL DEMAND?

Before policy-makers would commit to the idea of a required cash option, they would first want to know whether it would significantly reduce traffic congestion, air pollution, and energy consumption. To predict the consequences of offering employees the option of cash in lieu of a parking subsidy we have used the model described earlier in Section V. We estimate how those now offered free parking would respond to a rise in the price of parking to a level equal to the after-tax cash value of the tax-exempt parking subsidy each commuter is offered. Each commuter in the sample reported his or her annual income, and we have used this reported income to calculate the marginal income tax rate (federal, state, and social security combined) that each commuter would

have to pay on any taxable cash received in lieu of a parking subsidy.¹⁵ We assume that commuters react to an opportunity cost of \$1 in the same manner as to an out-of-pocket cost of \$1; that is, if a commuter forgoes the commute allowance in favor of free parking, that commuter has in effect "spent" the commute allowance on parking. Since the after-tax value of each commuter's parking subsidy is the "price" that commuter would "pay" for parking, the after-tax value of each commuter's current parking subsidy (taking into account each commuter's marginal income tax rate) was used as the price of parking for that commuter to predict the probability of choosing each mode.

Table 6 shows how offering employees the cash option would reduce solo driving and vehicle miles travelled by commuters to downtown Los Angeles. Conventional employer-paid parking induces 69 percent of commuters to drive to work alone, and they create 24.1 VMT per employee per day. If the employer allows commuters to choose cash in lieu of a parking subsidy, only 55 percent drive to work alone, and they create only 20 VMT per day. And when commuters pay the full market price for parking, they create 18.1 VMT per day. That is, the cash option would reduce VMT by 4.1 miles per employee per day, while ending employer-paid parking altogether would reduce VMT by another 1.9 miles per employee per day. Therefore, the commuter-friendly policy of allowing employees the option to choose cash in lieu of a parking subsidy would reduce average VMT by over two-thirds as much as would the commuter-unfriendly (and politically unpopular although analytically superior) policy of charging everyone the full market price for parking at work.

The data in Table 6 show that offering the cash option to employees who now receive employer-paid parking would reduce their solo share by 20 percent, and the number of vehicle miles travelled per employee by 17 percent. This reduction in VMT would also reduce the external costs these commuters create. Table 7 and Figure 3 summarize and compare the total social costs of commuting to downtown Los Angeles under the three scenarios (pay to park, park free with the cash option, and park free without the cash option). The last two rows of Table 7 show that offering these employees the cash option would reduce the total social cost of automobile commuting to downtown Los Angeles by \$40 million per year, or by 17 percent.

15. See Shoup and Willson (1992) for the schedule of marginal income tax rates applied to commuters' incomes.

TABLE 6

TRAVEL BEHAVIOR AND TRAVEL EXPENDITURES OF COMMUTERS
TO THE LOS ANGELES CENTRAL BUSINESS DISTRICT

<u>Travel Behavior or Travel Expenditure</u>	<u>Driver Pays for Parking</u>	<u>Employer Pays for Parking</u>	
		<u>With Cash Option</u>	<u>Without Cash Option</u>
1. Solo Driver Share	48%	55%	69%
2. Parking Spaces Occupied (per Employee)	0.56	0.62	0.75
3. Parking Expenditure (per Employee per Year)	\$563	\$626	\$750
4. Vehicle Miles Travelled (per Employee per Day)	18.1	20	24.1
5. Vehicle Miles Travelled (per Employee per Year)	3,919	4,383	5,230
6. Gasoline Consumed (Gallons per Employee per Year)	231	258	308
7. Auto Use Expenditure (per Employee per Year)	\$1,137	\$1,271	\$1,517
8. Parking + Auto Use Expenditure (per Employee per Year)	\$1,700	\$1,897	\$2,266
<u>Assumptions:</u>			
Days Worked per Year	217		
Auto Fuel Efficiency (MPG)	17		
Auto Use Cost (\$/Mile)	\$0.29		
Cost of Parking (\$/Month)	\$83.82		

TABLE 7

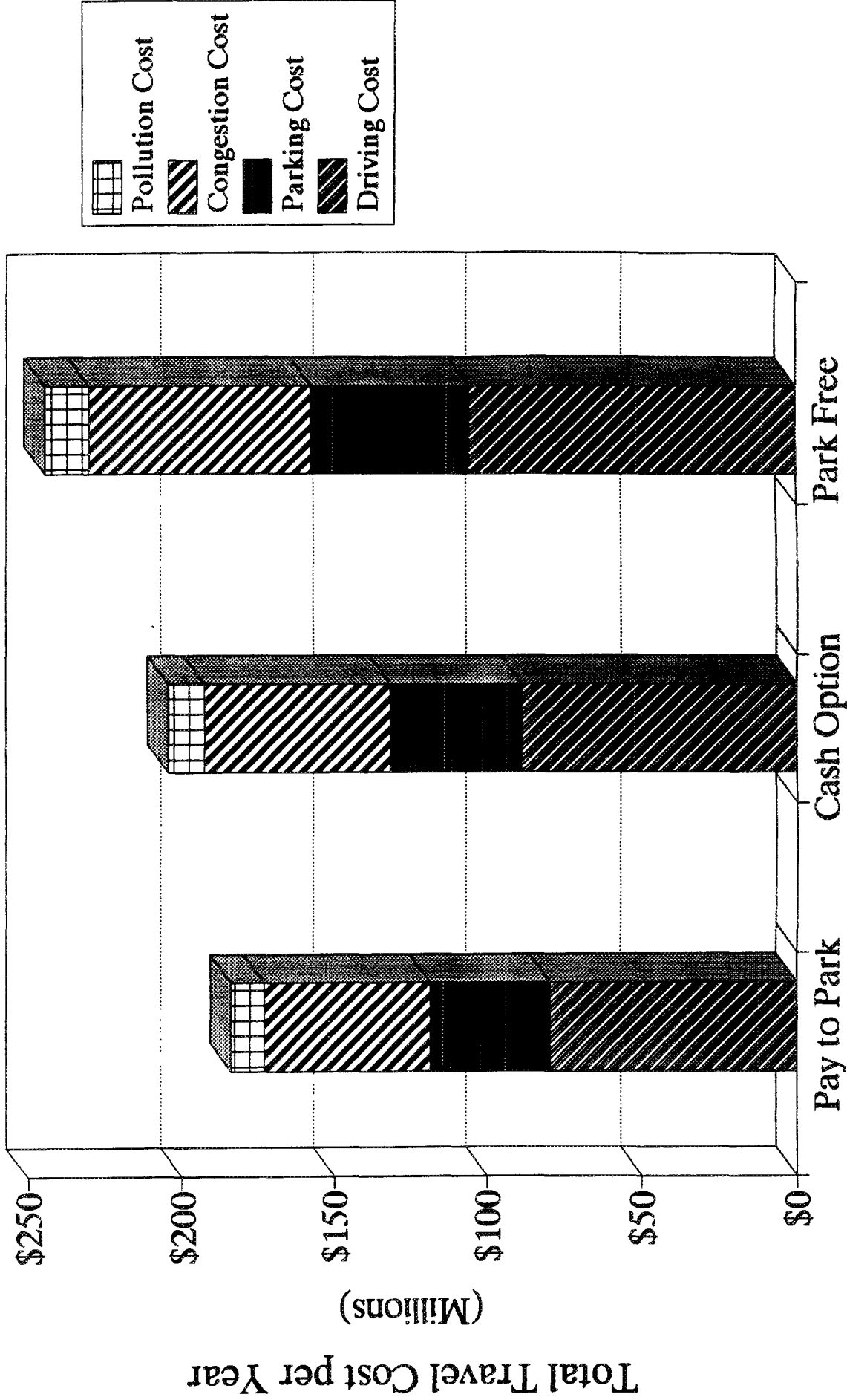
**HOW THE CASH OPTION WOULD AFFECT TRAVEL COSTS OF COMMUTERS
TO THE LOS ANGELES CENTRAL BUSINESS DISTRICT**

<u>Travel Behavior or Travel Expenditure (Total per Year)</u>	<u>Driver Pays for Parking</u>	<u>Employer Pays for Parking</u>	
		<u>With Cash Option</u>	<u>Without Cash Option</u>
1. Vehicle Miles Travelled	272,406,000	304,659,000	363,480,000
2. Congestion Cost Imposed	\$54,481,000	\$60,932,000	\$72,696,000
3. Pollution Cost Imposed	\$10,896,000	\$12,186,000	\$14,539,000
4. External Cost Imposed (Congestion + Pollution)	\$65,377,000	\$73,118,000	\$87,235,000
5. Private Cost of Auto Use (Driving + Parking)	\$118,226,000	\$131,602,000	\$157,713,000
6. Total Social Cost of Auto Use (Private + External)	\$183,603,000	\$204,720,000	\$244,948,000
7. Relative Cost	75%	83%	100%
Assumptions:			
Days Worked per Year	217		
Auto Fuel Efficiency (MPG)	17		
Auto Use Cost (\$/Mile)	\$0.29		
Cost of Parking (\$/Month)	\$83.82		
Congestion Cost (\$/Mile)	\$0.20		
Pollution Cost (\$/Mile)	\$0.04		
Number Offered Free Parking	69,503		

Figure 3

How the Cash Option Affects Travel Cost

For Commuters to Downtown Los Angeles



XIV. CONCLUSION: CONGESTION PRICING AND PARKING PRICING

Borrowing a concept from public finance, we have argued that employer-paid parking is similar to a matching grant: the employer will pay part of the employee's cost of commuting to work by automobile (the parking cost) only if the employee is willing to pay all the rest of the cost (the driving cost). Like any matching-grant, employer-paid parking stimulates an increase in the subsidized activity. For the 69,500 office workers in downtown Los Angeles who are offered it, we have estimated that employer-paid parking:

- ⊗ increases the number who drive solo to work by 44 percent.
- ⊗ increases the number of vehicle miles travelled to work by 91 million VMT per year.
- ⊗ increases gasoline consumption by 5.3 million gallons of gasoline per year.
- ⊗ increases the total cost of automobile commuting to downtown Los Angeles by \$61 million per year.

Parking subsidies have such a strong influence on commuters' travel choices because the subsidies are so large. For those who park free in downtown Los Angeles, their average parking subsidy is equivalent to 11 cents per vehicle mile travelled to work. Thus, imposing a congestion toll of 11 cents per mile travelled would raise the cost of driving to the Los Angeles CBD by only as much as employer-paid parking already lowers it for 69,500 commuters.

By exempting employer-paid parking subsidies from income taxation, the Internal Revenue Code's "special rule for parking" encourages employers to offer their employees free parking at work as a matching grant for driving to work. Continuing with the analogy from public finance, we have argued the case for converting this *matching* grant for *driving* to work into a *block* grant that employees can use for *commuting* to work. And to encourage employers to convert their matching-grant parking subsidies into block-grant commuting subsidies we have proposed an amendment to the Internal Revenue Code. This amendment would require that, to qualify for tax-exemption, employer-paid parking subsidies would have to be offered under an arrangement allowing the employee the option to receive, in lieu of the parking, the fair market value of the parking subsidy, either as a taxable cash travel allowance or as a mass transit or ridesharing subsidy.

For commuters to downtown Los Angeles, we have estimated that offering employees this option to cash out their current employer-paid parking subsidies would:

- ⊗ reduce the number of solo drivers to work by 20 percent.
- ⊗ reduce vehicle miles travelled to work by 59 million VMT per year.

- ⊙ reduce gasoline consumption by 3.5 million gallons per year.
- ⊙ reduce the total cost of automobile commuting to downtown Los Angeles by \$40 million per year, or by 17 percent.

Cashing out employer-paid parking subsidies and charging congestion tolls are complementary, and in some ways similar, policies, but there are also significant differences. Because there is currently a growing interest in the possibility of reducing congestion by charging tolls for driving on congested roads, we will conclude with some thoughts on both the similarities and the differences between cashing out employer-paid parking and charging congestion tolls.

First, employer-paid parking aggravates the problem that congestion tolls are meant to solve, but this does not mean that ending employer-paid parking would eliminate the need for congestion tolls. If cashing out employer-paid parking did significantly reduce peak period work travel demand, only congestion prices can prevent latent travel demand for other trip purposes from filling (and recongesting) all the roadway space vacated by commuters who take the cash and cease driving to work alone. Parking prices cannot do the job of congestion prices, just as congestion prices cannot do the job of parking prices.

Second, the failure to charge motorists for the congestion they create is a sin of omission - a failure to intervene in the transportation market to raise market prices to reflect social cost. In contrast, employer-paid parking is a sin of commission - an act of intervention that reduces the price of parking below the market rate, let alone the social cost. Ceasing an inappropriate intervention in the transportation market is as much of a "market policy" as is introducing a new intervention designed to correct for market failure. As a matter of priority, is it sensible to try to introduce new and technically complex congestion tolls to raise the price of automobile trips without first cashing out employer-paid parking subsidies that lower the price of those same automobile trips?

Third, as a practical matter, charging for parking is much simpler than charging congestion tolls. Indeed, many employers' schemes for subsidizing employee parking are often more difficult to administer than simply charging market prices for the same parking would be. For example, at UCLA the Campus Parking Service administers 240 different types of parking permit, all very carefully graded according to the status of each administrator, faculty member, staff member, or student. Despite the UCLA faculty's carefully tended reputation for strongly championing egalitarian social policies, UCLA's own parking permit system makes the *Titanic* look like a one-class ship.

Therefore, quite aside from any trip reduction benefits, cashing out employer-paid parking would in many cases simplify life, not complicate it.

Finally, in a political context, cashing out employer-paid parking should be more popular than introducing congestion tolls. Transportation economists, and especially congestion theorists, usually focus on devising ways to make motorists pay for the costs they cause. In contrast, our proposal to cash out employer-paid parking does not charge commuters for using parking, but rather pays them for not using parking. Cashing out employer-paid parking is like paying commuters to stop driving to work alone. It is a buy back, not a take away. Cashing out employer-paid parking would be a long step in the right direction because it rewards people for doing the right thing.

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