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The Politics and Economics of Parking on Campus

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THE POLITICS AND ECONOMICS OF PARKING ON CAMPUS

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Abstract

Universities have tried almost every possible way to deal with the shortage of campus parking: lotteries, hunting licenses, first-come-first-served, waiting lists, seniority, and need-based systems. As another way to eliminate parking shortages, this paper proposes using the Goldilocks Principle of parking prices to balance supply and demand: the price at any location is too high if many spaces are vacant, and too low if no spaces are vacant. When a few vacant spaces are available everywhere, the prices are just right and drivers can always find a place to park. The chapter concludes by proposing a pilot program to test drivers' responses to performance prices for campus parking.

Chapter 7

The Politics and Economics of Parking on Campus

Donald Shoup

Few institutions are so conservative as universities are about their own affairs while their members are so liberal about the affairs of others. Clark Kerr

Introduction

Big universities resemble small cities. They have athletic facilities, concert halls, housing, hospitals, libraries, museums, offices, restaurants, stores, theaters, and – of course – parking. Big universities also have big transportation problems, and to solve these problems a few universities have reformed their pricing policies for both parking and public transportation. The promising results of these reforms suggest that cities can adopt similar policies to reduce congestion, clean the air, and conserve energy.

Parking is a key element in transportation demand management (TDM), and universities have adopted two main approaches to campus parking policy: political and economic. The political approach relies on rules and regulations, while the economic approach relies on market prices. The results of these two approaches at the university level provide valuable lessons for TDM policies in the wider society.

What is the campus parking problem? Berkeley professors Horst Rittel and Melvin Webber once wrote, 'The information needed to *understand* the problem depends upon one's idea for *solving* it...The problem can't be defined until the solution has been found.'¹ In the spirit of this intriguing statement, I suggest that flexible prices are a solution that can help us understand the campus parking problem: *prices for campus parking can be adjusted to balance demand and supply at each location and time*. I will first examine how the administered approach to campus parking creates serious transportation problems, and will then explain how better pricing can solve these problems.

Administered Parking

University of California president Clark Kerr wrote, 'I have sometimes thought of the modern university as a series of individual faculty entrepreneurs held together by

¹ Rittel and Webber (1973, 161).

a common grievance over parking.² Earlier, as chancellor of the Berkeley campus, he remarked, 'The chancellor's job has come to be defined as providing parking for the faculty, sex for the students, and athletics for the alumni.' More recently, UCLA Chancellor Albert Carnesale said, 'At UCLA, parking is the most important issue for everyone.' UCLA has more parking spaces than all but two other universities in the United States – Texas A&M and Ohio State.³ If parking is so abundant, how did parking become more important than sex and athletics? Campus parking problems, I will argue, stem from mispricing, not scarcity.

Feudal Hierarchy

In academia, you are not what you drive as much as where you park. At Berkeley, for example, only Nobel Laureates are eligible for the highest status symbol on campus – a reserved parking space. After Charles Townes won the Nobel Prize for physics in 1964 and Berkeley put his name on a space, Townes commented, 'It saves me a whole lot of time. The cost is not the big thing – it's the convenience.'⁴ Shortly after Daniel McFadden won the Nobel Prize for economics in 2000, he received a standing ovation during halftime at a Cal football game. When asked which was better, the adulation of 50,000 people or the lifetime reserved parking space, he replied, 'Well, the parking space goes on and on. It's considered slightly more important than the prize itself.'⁵ The California Institute of Technology also reserves spaces for Nobel Laureates. After Rudolph Marcus won the Nobel Prize for chemistry in 1992, and a colleague saw his name on the reserved space outside his office, Marcus remarked, 'Well, the Nobel Prize has to be worth something.'⁶

Universities often lead society in advocating social and economic equality, but their complex parking hierarchies make the *Titanic* look like a one-class ship. UCLA, for example, has 175 different types of parking permits, carefully graded according to the status of each administrator, faculty member, staff member, and student. Major donors also receive campus parking permits based on the size of their donations. Parking privileges are cumulative, which means that holders of

2 Kerr (1966, 20). An earlier President of the University of California, Robert Gordon Sproul, defined the faculty even more succinctly: 'The faculty is a group of people who think otherwise.'

3 UCLA has 25,169 parking spaces. Texas A&M has 36,963 spaces. Ohio State University has 32,000 spaces. These other universities have big campuses in small cities, while UCLA has a much smaller campus in a much bigger city with far higher land values.

4 *The Chronicle of Higher Education* (11 August 1993). Professor Townes also told the *Contra Costa Times*, 'My parking space makes a very big difference to me' (31 May 2002). Professor Townes's work in the field of quantum electronics led to the widespread use of lasers.

5 'Severe Parking Crunch Plagues Universities,' *Los Angeles Times* (25 February 2001). Professor McFadden's work on the theory and methods for analyzing discrete choice has been especially influential in transportation economics.

6 'Life among the Nobility: For Southland's Laureates, the Thrill of Winning Comes in Small Ways,' *Los Angeles Times* (14 October 1994). Marcus continued to walk to work on most days, and kept his 1978 Oldsmobile for days he needed to drive.



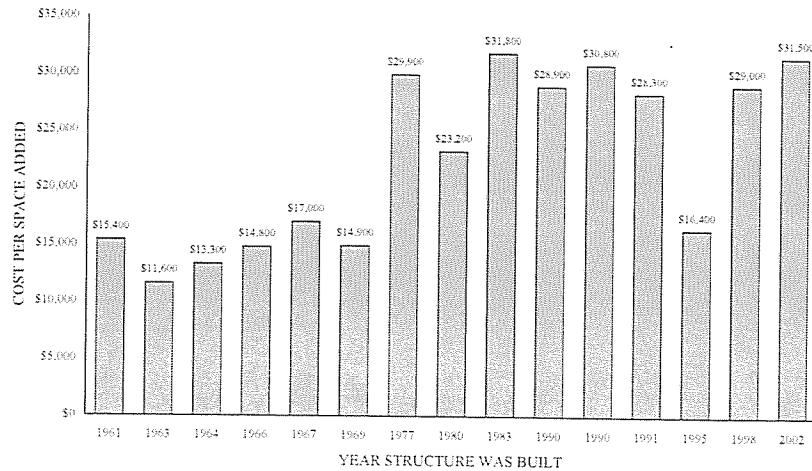
higher-ranking permits can park in the spaces reserved for their own rank *and* in the spaces available to all permits of a lower rank. Blue-permit holders can always 'park down' in the spaces reserved for the lower-ranking Yellow permits, for example, but Yellow-permit holders can 'park up' in the spaces reserved for Blue permits only after 4:30 p.m. when demand is lower. The best parking spaces on campus are reserved for the coveted 'X' permit, which allows holders to park in the premium spaces reserved exclusively for X permits *and* in the spaces reserved for all other permits. The X permit is the ultimate status symbol on campus, and is UCLA's equivalent to a knighthood.⁷

Average Cost Pricing

Because permit prices are not set to match demand with supply, parking shortages are to be expected. Students who cannot obtain a permit are put on a wait list, which the UCLA Transportation Service views as a measure of 'unmet need.' Building new parking structures to satisfy this unmet need is extremely expensive. After adjusting for inflation, the average cost of the spaces added since 1977 has been \$27,800 apiece

⁷ The UCLA Parking Services issues a 24-page booklet ('UCLA Parking Permit Privileges') to every permit holder to explain the complicated hierarchal system. At the top, the privileges of the X-permit holder are akin to the feudal *droit de seigneur*.

Figure 7.1 Cost per parking space added by fifteen parking structures



Year built (1)	Parking structure (2)	Spaces in structure (3)	Surface spaces lost (4)	Spaces added by structure (5)=(3)-(4)	Structure cost		Cost per space added	
					Current \$ (6)	2002 \$ (7)	Current \$ (8)=(6)/(5)	2002 \$ (9)=(7)/(5)
1961	5	765	219	546	\$1,091,000	\$8,421,000	\$2,000	\$15,400
1963	14	1,428	355	1,073	\$1,745,000	\$12,662,000	\$1,600	\$11,600
1964	3	1,168	213	955	\$1,859,000	\$12,985,000	\$1,900	\$13,300
1966	9	1,800	298	1,502	\$3,490,000	\$22,392,000	\$2,300	\$14,800
1967	8	2,839	666	2,173	\$6,061,000	\$36,896,000	\$2,800	\$17,000
1969	2	2,253	323	1,930	\$5,610,000	\$28,903,000	\$2,900	\$14,900
1977	CHS	921	319	602	\$7,084,000	\$17,980,000	\$11,800	\$29,900
1980	6	750	200	550	\$6,326,000	\$12,777,000	\$11,500	\$23,200
1983	4	448	0	448	\$8,849,000	\$14,229,000	\$19,800	\$31,800
1990	1	2,851	346	2,505	\$52,243,000	\$72,182,000	\$20,900	\$28,900
1990	RC	144	53	91	\$2,040,000	\$2,819,000	\$22,300	\$30,800
1991	SV	716	0	716	\$14,945,000	\$20,209,000	\$20,900	\$28,300
1995	3 Addition	840	118	722	\$9,900,000	\$11,831,000	\$13,700	\$16,400
1998	4 Addition	1,263	0	1,263	\$33,217,000	\$36,685,000	\$26,300	\$29,000
2002	7	1,500	0	1,500	\$47,300,000	\$47,300,000	\$31,500	\$31,500
Total		19,686	3,110	16,576	\$201,760,000	\$358,271,000	-	-
Average 1961-1969		1,709	346	1,363	\$3,300,000	\$20,400,000	\$2,300	\$14,500
Average 1977-2002		1,048	115	933	\$20,200,000	\$26,200,000	\$19,900	\$27,800
Average 1961-2002		1,312	207	1,105	\$13,500,000	\$23,900,000	\$12,800	\$22,500

Note: The ENR Construction Cost Index is used to convert current dollars to 2002 dollars.

(see Figure 7.1).⁸ Seven of the nine structures built since 1977 have some or all spaces underground, which helps explain this high cost: underground parking requires expensive excavation, shoring, waterproofing, fireproofing, ventilation, and lighting.

Since the price of a parking permit is far below the cost of a new parking space, drivers who park in a new structure pay only a small fraction of the marginal cost of their parking. For example, UCLA opened a \$47 million, 1,500-space parking structure in 2003. The capital and operating expenses were \$223 per space per

⁸ See Shoup (2005) for the cost of UCLA parking structures.

month, but the price of a parking permit was only \$55 a month.⁹ Because the capital and operating costs are so high and the permit price is so low, new parking structures have a long payback period (the number of years before the accumulated cash inflow from operations will repay the initial capital cost). One campus parking structure opened in 2004 will have a payback period of 30 years.¹⁰ How does this compare with the payback periods for other campus investments? UCLA's criterion for investing in energy conservation is that the payback period must not exceed three years (the money saved by reducing energy use must repay the capital cost in three years or less).¹¹ Because the estimated payback period for solar panels is about nine years, for example, UCLA does not invest in these panels. For a sustainable campus, it seems unwise to reject a solar investment that will take only nine years to repay its capital cost but build a parking structure that will take 30 years to repay its capital cost and will also – by attracting more cars to campus – increase energy consumption, traffic congestion, and air pollution. When it comes to promoting sustainability, UCLA seems to focus first on sustaining the Parking Service.

The difference between the high cost of a new structure and the low price charged for parking in it creates a substantial deficit for the structure. UCLA finances this deficit by raising the prices charged for all the other parking spaces on campus. Because the marginal cost (the cost of adding another space to the parking supply) is so far above the average cost (the total cost of the system divided by the total number of parking spaces), each addition to the parking supply drives up this average cost. Permit prices that cover the system's average cost increase every time a new parking structure is built (see Figure 7.2), yet the shortage of parking persists.¹² Even after spending \$358 million (in 2002 dollars) to construct 19,700 parking spaces since 1961, UCLA cannot provide a parking space for every student who is willing to pay the system's average cost for a permit.¹³

9 Brown, Hess, and Shoup (2003, 77).

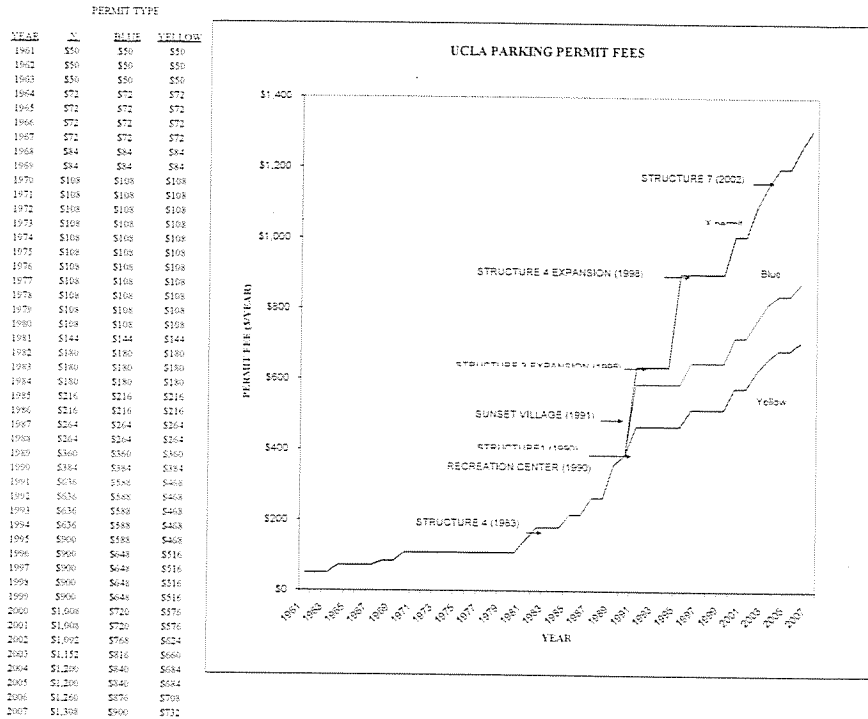
10 Message from the Assistant Vice Chancellor for General Services on 16 November 2005. This payback calculation assumes steady increases in the price of parking permits during the next 30 years. The ratio between initial capital cost and the first year's cash flow is more than 50 years.

11 Message from the Assistant Vice Chancellor for General Services on 14 November 2005.

12 Toor and Havlick (2004) explain that when most parking on a campus is in surface lots, building the first structure does not greatly increase the average cost of parking because the high cost of a new structure is averaged with the low cost of the many surface spaces. But as surface lots disappear and more structures are built, the average cost rises rapidly. This phenomenon helps explain why the price of parking at UCLA increased slowly when the first structures were built in the 1960s, but increased rapidly after 1980 when few surface spaces remained. Until 1990, the three main types of permits (X, Blue, and Yellow) were priced the same; when four new parking structures were built in the early 1990s, the prices of X and Blue permits were increased above the price of Yellow permits to generate more revenue.

13 Parking spaces are even more expensive at Harvard, where the cost of building, financing, and maintaining the campus parking system will amount to more than \$500 million during the next 25 years (Harvard University Operations Services 2001, 4). Most parking will be built underground at an estimated cost of \$60,000 per space.

Figure 7.2 UCLA parking permit fee history



UCLA gives priority to administrators, faculty, and staff for permits in the locations they want, and allocates the remaining permits (about 10,000) to students. As a result, all new permits made available by a new parking structure are allocated to students.¹⁴ UCLA then increases the fees for all permit holders – primarily faculty and staff – to cover the cost of the new structure. UCLA’s Faculty Welfare Committee wrote to a Vice Chancellor to ask about the economics of a new parking structure built in 1998:

Do you think that it is either fair or efficient for UCLA to build new parking spaces that cost \$170 a month, offer all the new parking permits made available by these parking spaces to students at a price of \$43 a month, and finance the subsidy by raising faculty and staff parking fees?

14 All the new permits made available by a new parking structure are allocated to students, but not all of the new students permits will be in the new structure because some administrators, faculty, and staff may shift into the new structure and release their previous spaces.

The Vice Chancellor responded:

In our view, this planned approach is fair, efficient and appropriate.¹⁵

Most universities follow this average-cost pricing approach. A professor at the University of Illinois, for example, told me that after he recommended charging the users of new parking structures a price that would cover the cost of building them, an astonished administrator responded, ‘Why, if we did that, we wouldn’t build any parking structures!’¹⁶ This objection is unfounded, of course, because parking structures can be built where drivers are willing to pay the cost-recovery price of parking in them.

Parking Anxiety

Because parking without a permit is difficult, students apply for a permit even if they don’t intend to park on campus every day. And because demand exceeds the supply for parking spaces that are priced far below their cost, administrators have devised a ‘point system’ that ranks students’ priority for campus permits.¹⁷ A student’s chance of receiving a permit is based on a jumble of factors that supposedly measure the ‘need’ for parking, and the distance from home to campus is the chief measure of need. Each factor is assigned a point value, and the points are totaled to decide a student’s priority for parking. Yet students’ anxiety about the point system extends far beyond the simple issue of *whether* they get a parking permit; point totals also determine *where* they park. As Bob Hope joked, ‘It takes four years to get through UCLA, or five if you park in Lot 32.’ Because a permit to park in remote Lot 32 costs the same as a permit to park at the centre of campus, students whose point totals put them in Lot 32 will never be satisfied if other students pay the same price to park in more central locations.¹⁸

To see the effects of the point system, consider the results of a 1983 survey to learn the major problems experienced by UCLA students. The Student Affairs Information and Research Office sent questionnaires to a stratified sample of 8,852 students selected to represent the entire student body, and 4,400 students responded – almost one of every seven students at UCLA. Seventy percent of all respondents reported that parking was a problem, while only 12 percent were on the waiting list for a parking permit. In a subsequent survey of 2,681 students in 1989, 69 percent of students reported that parking was a major problem, while only 9 percent were on

15 Memorandum from the Associate Administrative Vice Chancellor to the Faculty Welfare Committee on 17 September 1998.

16 Message from Professor Bruce Hannon, 9 July 2004.

17 The point system is described on the website of the UCLA Parking Services at <www.transportation.ucla.edu>.

18 To get students from Lot 32 to the main campus, UCLA provides a shuttle bus system; originally intended only for Lot 32 parkers, it has grown over the years, and now stops at other parking structures on campus, so that drivers can park and ride the shuttle to and from their final destinations on campus. In 2006–2007, UCLA spent \$2.2 million on the shuttle buses; UCLA’s average cost was \$2.19 per ride on the shuttle, which is free to the users.

the waiting list. In both surveys, most students who identified parking as a problem either had a permit or never applied for one. Even the students who have permits think parking is a problem, but the problem is caused by faulty *pricing*, not by an insufficient *quantity* of parking. Yet the 'need-based' point system of allocating permits makes it seem as though the parking problem has only one long-term solution – build more parking structures, no matter how much they cost.¹⁹

Parking may seem trivial but it's a serious problem in the minds of many students. In the 1983 survey, 70 percent of students reported parking as a problem, more than any other problem they experienced. Only 28 percent felt their writing skills were a problem, and only 24 percent felt their math skills were a problem. If most students see parking as a bigger problem than writing and math, the parking problem must be serious. The 1989 survey found almost identical results. Sixty-nine percent of students reported that parking was a major problem, while only 12 percent reported 'too much school work' as a major problem. Perhaps because of these depressing findings, UCLA has not conducted similar studies in recent years.

Cheating for Parking

Underpricing anything creates a shortage, and parking is no exception. UCLA's point system is intended to deal with the self-inflicted parking shortage by distributing permits according to 'need.' The chief measure of a student's need for parking – distance from home to campus – is based on the idea that students who live farther from campus have a greater need for parking. This sounds sensible, but since most UCLA undergraduates come from Southern California, they have a parent, grandparent, or other relative whose address they can use as a home address. Even students who live in apartments a few blocks from campus can get more points by claiming they live at a relative's home that is far from campus. Many students who live near campus freely admit they have used a false address on their permit applications to get a better parking space; as the Chair of UCLA's Parking Review Board said in the *Daily Bruin*, 'From what you hear on campus, everyone is lying.'²⁰

In 1997, UCLA's Academic Senate appointed members to a review committee to examine whether the point system encourages students to misrepresent their circumstances when applying for parking permits. Students on the committee were frank about the problems with the point system. One student member of the committee said, 'Students are driven to dishonesty by a need-based student point system.'²¹ Another student said, 'A lot of students use their [parents'] home addresses if they live in this area,' making their commutes seem longer and therefore earning

¹⁹ Setting parking fees below marginal cost has long created a seemingly insatiable demand for new parking spaces on campus. Writing on the campus parking problem in *Traffic Quarterly* in 1956, the Dean of the University of Michigan's College of Architecture and Design, Wells Bennett, concluded, 'The only solution of the campus parking problem is *more parking*' (Bennett 1956, 105, italics in the original).

²⁰ *UCLA Daily Bruin* (23 September 1980).

²¹ Minutes of the 30 April 1997 meeting of the Ad Hoc Review Committee for the Point System.

more points for a parking permit. 'I'm from up north, so I can't do that.'²² That is, the student's complaint was that she herself couldn't falsify her parking application. Confirming these views, the President of the Graduate Students Association wrote to the Chancellor:

Almost all students, as well as many faculty and staff, know about the need to lie on parking permit applications. Resident Assistants in the dormitories, who must give an educational lecture once a quarter, even offer sessions about cheating to maximize points awarded when filling out their applications.²³

Defending the point system, however, the Director of the UCLA Transportation Services argued, 'Cheating is rampant throughout society and the point system is not itself the cause of the cheating.'²⁴

After complaints about the ethical problems caused by the point system, in 1998 UCLA engaged a consultant to survey the staff members who advise students. These student advisors expressed serious concerns about the almost compulsory dishonesty engendered by the system:

One of the biggest concerns interview participants have is that students frequently lie or falsify data in order to get a parking permit. Most believe that cheating is rampant and that students routinely lie and coach others to lie to get enough points for a permit. Some say that the current system encourages dishonesty and unethical behavior, rewarding those who 'play the system' most effectively.²⁵

The consultant also interviewed focus groups composed of student government representatives and randomly selected students who applied for parking permits. These students expressed similar concerns about the point system:

Each focus group talked about the ease with which students are able to falsify information on the parking application, indicating that commuting address and employment status are easiest to lie about. A fair amount of discussion centred on how students cheat on commuting address – how they quickly learn not to list a local address, how they use the address of parents or relatives, how they share with friends and new students the best zip codes to use.²⁶

22 *UCLA Daily Bruin* (1 May 1997).

23 Letter from Andrew Westall to Chancellor Carnesale, 26 May 1998.

24 Minutes of the 12 February 1997 meeting of the Ad Hoc Review Committee for the Point System.

25 Sundstrom and Associates (1998, 9, *emphasis* in the original). This information did not surprise the administration. As the Dean of Students Robert Naples wrote, 'Mostly everything I'm hearing from students supports your statements' (e-mail message from Dean Naples on 12 October 1999).

26 Sundstrom and Associates (1998, 32, *emphasis* in the original). To gain additional information about these perverse incentives for dishonesty, the consultant then conducted a survey of 1,074 students. One question in the survey was: 'How significant is the problem of students falsifying information on their parking application?' In response, 76 percent of students reported that the problem of falsifying information of parking applications is either

A student who lives in an apartment in West Los Angeles (-4 points), for example, may report living at his or her parents' home in Long Beach (+16 points). The ease of claiming to live at home with one's family makes it almost impossible for the Parking Service to audit thousands of permit applications for false addresses.

In 2006, focus groups of students and of the administrators responsible for advising students were surveyed again about ethical problems created by the point system. Administrators reported that, 'Falsification of application information [is] seen as a given, part of the UCLA culture.' Students did not express a great deal of concern about providing false information on applications for permits, and a majority agreed that, 'Falsification will always exist because people will figure out how to game the system.'²⁷

Similar views are expressed frequently in the campus newspaper, *The Daily Bruin*. In 1999, for example, one student wrote, 'Lie, cheat, and steal. These are the fundamental traits Transportation Services wants you to learn here at UCLA.'²⁸ Students sometimes criticize the point system at embarrassing times. During the Law School's graduation ceremony in 2000, the president of the graduating class said in her speech, 'I learned to get good grades, you had to work, work, work, but to get parking at UCLA you had to lie, lie, lie.'²⁹

The point system encourages students to lie on their permit applications even if they expect they would receive a permit without lying. Why? All spaces on campus are the same price, but some are remote and inconvenient. If students need more points to get a space in a better location, and they suspect most of their peers are lying, many students are tempted to lie even if they don't need to in order to get a permit. Cheating to get a better parking space on campus resembles doping to improve athletic performance. If athletes believe their competitors use performance-enhancing drugs and that detection is difficult, they too will be tempted to use drugs. When two-time Tour de France champion Fausto Coppi was asked if he had ever used drugs, for example, he replied, 'Only when necessary.' When was that? 'Almost always.'³⁰

Even the University's own official publications casually refer to campus parking scams. *UCLA Arts*, for example, commented on the 'notorious parking permit black market, allowing students to finance an entire college education with one Blue 5 permit.'³¹ Parking on campus is an ethics-free zone, and students do whatever it takes to get a permit. Although the point system fails to allocate parking spaces fairly, efficiently, or ethically, it may have one educational value: it trains students to prepare an income tax return. Campus parking scandals even break into the national news, as when 22 UCLA football players were found using disabled placards to park

'very significant' or 'somewhat significant.' Only 8 percent of students reported that the problem is 'not significant' (Sundstrom and Associates 1999).

27 Sundstrom and Associates (2006, 11 and 19).

28 *UCLA Daily Bruin* (5 October 1999, 16).

29 *UCLA Daily Bruin* (22 May 2000, 14).

30 Wheatcroft (2003, 207). A big difference between doping and lying is that doping can damage your health; Fausto Coppi died at age 40.

31 'Parking Nightmares and other Horror Stories,' *UCLA Arts*, Spring 1999, 14. A Blue 5 permit is a permit to park in the better spaces in Parking Structure 5.

on campus. The athletes got their bogus placards by forging doctors' signatures for such conditions as asthma and palsy.³²

As a result of many serious accusations about the point system, UCLA's Academic Senate requested the Chancellor to appoint a committee to study the problem, but he declined the request because, he said, 'The allocation of parking permits is delegated to an organisational level well below that of chancellor, and I consider that to be appropriate.'³³

Parking does have a low status in the university hierarchy. The Director of UCLA Transportation Services reports to the Assistant Vice Chancellor for General Services, who reports to the Associate Administrative Vice Chancellor, who reports to the Administrative Vice Chancellor, who reports to the Executive Vice Chancellor, who reports to the Chancellor. Transportation is thus five organisational levels below the Chancellor.

These many levels of bureaucracy help explain how a faulty parking allocation system can persist. Top administrators, busy with other matters, see parking as a sideshow, and everything looks fine from their privileged 'X-permit' view of the world. Lower-level parking administrators control big budgets, undertake big construction projects, employ a big staff, and have their own agenda; they present themselves as experts who know how to handle the sideshow and its \$40 million annual budget. Because the parking system is self-supporting – funded mainly from parking fees paid by faculty, staff, and students – it appears to take care of itself without taxing the university's general budget and thus escapes the careful, thoughtful, and exacting scrutiny given to all the academic departments on campus.

A need-based parking system engenders distrust on campus. A staff member of the UCLA Parking Service once used an intriguing analogy that helps to explain this distrust. The Parking Service awards permits like a professor who grades exams on a curve, she said. The point total necessary for a permit in a good location is determined only after all the applications have been received, just as the score needed for an A is determined only after all exams have been graded. The point system does resemble grading on a curve, and that creates ethical problems. Suppose you were a student in a class where your entire grade depended on the final exam. You have heard that cheating is easy, difficult to detect, and almost never punished. You have also heard that most students cheat on their exams, which are graded on a curve. What would you do, and what lessons for life would you draw from the experience? Students learn they can get by without their scruples, but not without their cars.

32 The Academic Senate's request for a committee to examine student parking allocation was rejected only two months after the football players' scandal. UCLA seems to be unusual only in the large number of football players who were caught misusing disabled parking placards. Similar scandals have erupted on many campuses. In 2003, the quarterback at Florida State University earned national attention for parking his SUV in spaces reserved for the disabled ('More Car Trouble for FSU's Rix,' *Tallahassee Democrat*, 24 September 2003). Also at FSU, when a student refused to pull out of a faculty parking space, a business professor rammed his Pontiac Grand Am into the student's Nissan twice, which is more violent than the shouting matches and occasional fistfights that are more typical ('A Strain on Civility?' *Chronicle of Higher Education*, 11 August 1993).

33 Memo from the Chancellor to the Chair of the Academic Senate, 22 November 1999.

Cheating for parking is not unique to UCLA, of course. For example, the University of New Hampshire requires first-year students to submit documentation of need with their applications for campus parking permits. Marc Laliberte of the university's Transportation Services wrote:

It's very clear that many of these letters are pure baloney, but you can't call them liars without getting their parents (often equally eager to join in the ruse) in your face. I'm considering eliminating the documentation-of-need procedure since it was enacted when we had far fewer parking spaces on campus and since it takes forever to read them all, and since I'm sick of feeling like I'm getting lied to 100 times a day. We feel that commuter students who live within one mile of campus (who are not eligible for a permit) often just give us their home address instead of their apartment address. One can walk through a local off-campus apartment complex within a mile of campus and see many commuter permits. Of course at the time they are out of our jurisdiction, and there's really no hard evidence that they live at this complex, just a strong suspicion and circumstantial evidence. We don't really know what to do with these people.³⁴

Students who lie to obtain a campus parking permit don't deserve all the blame for their actions. Consider the finding in the dismissal of a race-discrimination claim by a graduate student who was terminated at the University of Illinois for allegedly altering a campus parking permit. The U. S. Court of Appeals for the Seventh Circuit concluded, 'This case concerns the corrupt, Machiavellian world of permit parking at the University of Illinois's Urbana-Champaign campus, and the ill fortune of a student who became involved in it.'³⁵ If a campus parking permit system is corrupt and Machiavellian, can we expect the students to remain incorruptible?

Inflated Parking Demand

UCLA's point system is meant to measure the 'need' for parking. Students whose need is judged to be lower than that of the approximately 10,000 students who do receive a permit are put on a waiting list. To reduce the waiting list, UCLA builds extremely expensive parking structures (\$31,500 per space in the most recent structure) to provide parking for students who have been judged to need it least – primarily solo drivers and those who live near campus.³⁶

³⁴ Personal communication from Marc Laliberte on 30 September 1999.

³⁵ Stevens (2007) explains the decision in *Brewer v. Board of Trustees of University of IL*, 479 F.3d 908 (7th Cir. 2007).

³⁶ The goal of the Parking Service is to reduce the Fall Quarter waiting list to zero, although the Spring Quarter waiting list is already zero in most years: 'By Spring Quarter we do not have a wait list as student demand is lower at this time of year. One reason is fewer students are in school. We get a quarterly list from the registrar of those withdrawn and know several hundred withdraw by Spring' (Memo from Director of UCLA Transportation Services to the Faculty Welfare Committee on 10 May 1996). The goal is thus to build enough parking spaces to meet the peak demand at a price much lower than the cost of providing the new parking spaces, even if these spaces are used only in the Fall Quarter by students who live close to campus and drive to campus alone.

Among all the factors intended to measure the 'need' for parking, what is verifiable (such as being an athlete) seems arbitrary, and what is not arbitrary (how far from campus one lives) is not verifiable. The ease of claiming a false address, for example, means that the students who are most willing to lie tend to get the best parking spaces. Defending the point system, the Director of UCLA Transportation Services wrote, 'As flawed as the point system is, we feel it is better than a lottery, for example, where need is not taken into account at all.'³⁷ To say that something is better than a lottery is not a strong argument, but many universities are drawn to lotteries to replace a failed system for distributing permits. Duke University, for example, considered a lottery to replace its first-come-first-served system for allocating student parking permits: 'With the first-come-first-served method, we find a feeding frenzy results, with thousands of people waiting to hit the online registration site the minute we turn it on. This creates a heavy load on the system and 'registration rage' if there are any technical glitches.'³⁸

Lotteries and waiting lists are an attractive alternative because they appear to give everyone an equal chance of getting a permit, and the appearance of equality is a prominent feature of parking systems at many universities. Consider how *The Chronicle of Higher Education* described a new system to distribute parking permits at the University of Iowa:

A strong current of 'Midwestern egalitarianism' at the university made it difficult to suggest favoring professors over staff members on the waiting lists. The new system, a Solomonic marvel, was devised by parking services and the university's staff council. It created two seniority-based waiting lists for every faculty and staff lot – one for professors and the other for staff members. As spaces become available, they are offered to the top person on each list by turns – faculty, staff, faculty, staff. Over time, popular lots will end up 50-percent faculty, 50-percent staff, even though staff members outnumber faculty members by more than five to one...For deans trying to hire star professors, the system has additional flexibility. A dean can ask that a faculty member be put at the top of the faculty list.³⁹

When prices are the same in all lots on campus, everyone wants the most convenient spaces, and most people will put their names on the waiting list for a better space. As proved by the long waiting lists for the choice lots, the seemingly high 'demand' for convenient parking justifies new parking structures, but the users' parking fees pay only a small share of the cost. Inept distribution of underpriced permits thus leads to a bloated and highly subsidized parking supply.

UCLA allocates most new parking spaces to students who were on the waiting list for permits rather than to drivers who pay by the day. The marginal cost of parking is zero for all permit holders, and other drivers cannot park no matter how

37 Memo from the Director of Transportation Services to the Faculty Welfare Committee on 10 May 1996.

38 E-mail message from George Oberlander at Duke University, 16 November 2004.

39 'Notes from Academe,' *The Chronicle of Higher Education*, 5 October 2001. Even the old system, which was based on the date a staff or faculty member put their name on the waiting list for a particular lot, gave faculty requests a boost by automatically backdating them a year.

great their need. Relatively few spaces are available to drivers without permits, and UCLA typically puts out the 'full sign' for daily parking by 10 a.m. To see the problem, consider this e-mail message from a professor of engineering at UC Irvine, who drove up to UCLA for a meeting:

Sorry that I was not at your meeting with Gary Hart at UCLA. I did try; I arrived at the parking kiosk before 2 p.m. and was told by the attendant that all the campus lots are full and I may be able to park in a public lot several blocks away. After finding the lot, it was also full. So, I gave up and drove back to my office, partly because it was 100 degrees outside and my presence was not essential. I will try to communicate my thoughts to you some other time. I trust you had a good meeting.⁴⁰

The round-trip from Irvine to UCLA is 110 miles! The professor's trip was fruitless because most campus parking spaces were occupied by students, staff, and faculty who can park free once they get their permit. If UCLA is an ivory tower, the Parking Service is its moat.

Increased Vehicle Travel

As the saying goes, if you build it, they will come. After the \$47 million Structure 7 opened in 2003, the *Daily Bruin* interviewed several delighted new users: 'Alicia de Anda used to park her car on the corner of Beverly Glen and Sunset Boulevard every morning for a 25 minute walk to campus. Now one of the 545 proud owners of a Lot 7 parking permit, de Anda is thankful the new structure opened early. "There are quite a few students who park on Sunset," de Anda, a fourth-year art history student, said. "It's a pain walking when it's hot or when it's raining."⁴¹

The new parking structure also attracted former vanpoolers. One new student driver happily reported, 'I didn't have a permit before so I had to vanpool. For me, having a permit is awesome.'⁴² Paying only \$55 a month to park in a space that costs UCLA \$223 a month is awesome. That's quite a subsidy, and there's probably no better deal on campus.

Underpricing creates the demand for more parking spaces on campus, and the added spaces increase other costs in the transportation system. After all, universities provide new parking spaces so drivers can use them. We should therefore ask: do the additional parking spaces increase vehicle travel? If so, how will this added vehicle travel increase the external costs of traffic congestion and air pollution?

Parking spaces do not create vehicle travel, but they clearly enable it. The phenomenon of vehicle travel induced by new parking spaces (added vehicle-storing capacity) is similar to vehicle travel induced by new roads (added vehicle-carrying capacity). The environmental impact report (EIR) for UCLA's newest parking structure provides an example of how new parking spaces increase vehicle travel.

⁴⁰ E-mail message on 14 October 1997. Some professors might not have been so even-tempered about the incident, but the mismanagement of campus parking is so common the incident did not seem extraordinary to the frustrated visitor.

⁴¹ *Daily Bruin*, 9 April 2003.

⁴² *Daily Bruin*, 9 April 2003.

traffic congestion, and air pollution. The EIR was conducted for the 1,500-space Parking Structure 7, completed in 2003.⁴³ The EIR provides full documentation for nearly every aspect of the structure, including the estimated increase in the number of vehicle trips to campus and vehicle-miles travelled (VMT).

The EIR reports that the 1,500 new parking spaces generates 5,630 one-way vehicle trips per weekday, or 3.8 trips a day per space, implying a parking turnover rate in the structure of 1.9 vehicles a day per space.⁴⁴ If we assume that the structure is used only 22 weekdays a month, each space generates 82.6 vehicle trips a month (which underestimates total trips because no trips are calculated for the weekends).⁴⁵ The EIR reports that the average distance for vehicle trips to campus is 8.8 miles, so each space generates 727 VMT a month per space (82.6×8.8), and the structure generates 1.1 million VMT a month ($727 \times 1,500$).⁴⁶

This added vehicle travel is not a problem for UCLA, but it is for Los Angeles, which has the worst traffic congestion in the nation; in 2002, the cost of wasted time and added fuel consumption caused by traffic congestion in Los Angeles was estimated at \$11.2 billion.⁴⁷ To put this congestion cost in perspective, in 2002 the total general revenue of all cities in California was \$13.7 billion.⁴⁸ That is, the cost of traffic congestion in Los Angeles alone may be almost as high as the total general revenue of all cities in California combined. In this congested environment, added vehicle travel to campus makes a bad situation for the region even worse.⁴⁹

43 Intramural Field Parking Structure Final Environmental Impact Report, State Clearinghouse Number 1999091001, University of California, Los Angeles, May 2001. Because UCLA commissioned the EIR, the structure's environmental impacts are unlikely to be overestimated.

44 $5,630 \text{ trips} / 1,500 \text{ spaces} = 3.753 \text{ one-way trips}$ or 1.9 round-trips a day per space.

45 $3.753 \times 22 = 82.6 \text{ one-way trips}$ a month. The neglect of weekend traffic produces a conservative estimate of vehicle trips and VMT per month.

46 This estimate may sound high, but it is based on uniformly conservative assumptions because the VMT are estimated only for weekday trips, and the average one-way trip distance is only 8.8 miles, while the average one-way automobile commute to work in Southern California is 15 miles. Annual surveys conducted between 1989 and 1996 found that average one-way vehicle commute distances ranged from 14.8 to 16.9 miles (Southern California Association of Governments 1996).

47 Texas Transportation Institute (2004, Tables 1 and 2). The Texas Transportation Institute (TTI) annually surveys traffic data in American cities, and calculates the Roadway Congestion Index to rank them by the severity of their traffic congestion. Los Angeles has ranked highest on the TTI Roadway Congestion Index in every year since 1983.

48 California State Controller (2004, Figure 7.1). General revenues are defined as revenues that cannot be associated with any particular expenditure; examples include property taxes, sales taxes, and business license fees. General revenues do not include fees and charges for direct services, such as the revenue from municipally owned electric utilities.

49 Beyond the impacts of *using* the new 1,500-space parking structure, *constructing* it required excavating the 10-acre site to a depth of 31 feet. Removing 222,000 cubic yards of earth required 26,000 truck trips (sometimes more than one every minute) through the campus and Westwood Village on their route for disposal.

Campus parking is closer to communism than to capitalism but it manages to combine the worst features of both systems. Universities distribute parking according to status and purported need but rarely give any preference to low-income staff or students. Providing cheap parking on expensive land inflates the demand for travel by car and does nothing to help those who cannot afford a car. So let's consider a novel alternative: *let market prices allocate parking spaces.*

Performance-Priced Parking

With all the intellect on campus, one would expect universities to teem with creative ideas about how to solve the parking problem. Nevertheless, most universities price parking at average cost and distribute permits according to status or assumed need. Research in economics, political science, and urban planning seems to have little impact on administrators. Naturally, professors should not expect to decide how to allocate campus parking because universities hire faculty to think and they hire administrators to make decisions. Problems can arise when the faculty try to make decisions and administrators try to think. Nevertheless, administrators should not totally ignore academic research in making university policy.

A few universities do charge higher prices for the more convenient parking spaces in high demand. Washington State University, for example, uses a zone system of parking prices. The price in each zone is set according to three criteria: proximity (location with respect to major destinations on campus), quality of the facility (garage, paved surface, or gravel surface), and demand (competition for the zone). WSU sets fees that allow drivers to choose the parking spaces they are willing to pay for.⁵⁰ Taking the zone system to its logical economic conclusion, prices for parking can be adjusted to balance demand and supply at each location and time.

Flexible prices can balance demand – which varies over time – with the fixed supply of spaces. We can call this balance the Goldilocks Principle of parking prices: the price is too high if too many spaces are vacant, and too low if no spaces are vacant. When a few spaces are vacant everywhere, the price is just right. If a parking shortage or surplus regularly occurs at any time in any location, the price can be raised or reduced. If prices keep a few spaces vacant at every location, drivers can always find an available space near their destination.⁵¹

⁵⁰ Shaheen and Khisty (1990). John Shaheen is the Director of WSU's Parking, Transportation and Visitor Center.

⁵¹ The purpose of charging the right price for parking is to ration a scarce resource, *not* to finance the cost of constructing it. Public agencies often price facilities at their cost of provision, regardless of the market, but parking spaces should be priced at their market value, regardless of their construction cost.

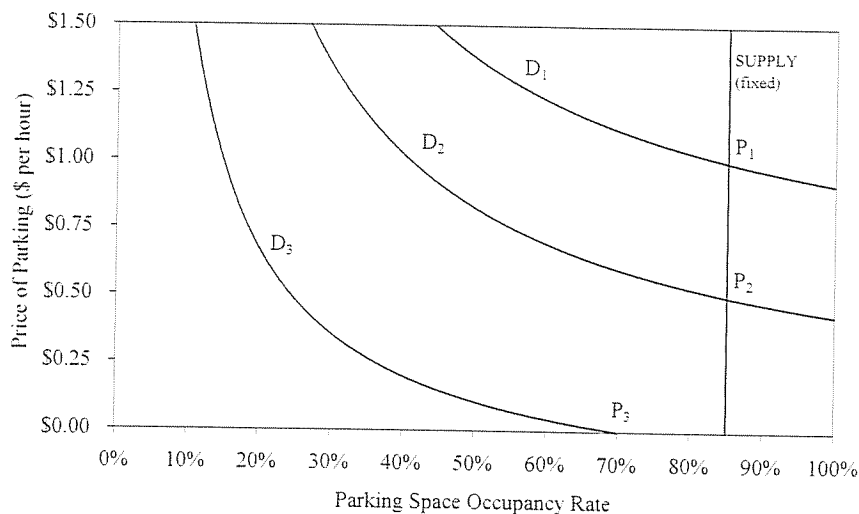
Performance-Based Prices

If the goal of pricing is to create a few vacancies everywhere, what is the appropriate vacancy rate? Traffic engineers usually recommend that about 15 percent of spaces should remain vacant to ensure easy access. This cushion of vacant spaces eliminates searching for a place to park, which can be a major source of frustration for students and faculty with time-sensitive schedules. If we accept this recommendation, the performance-based price for parking should vary by time and location to balance a variable demand with the fixed supply and produce a stable vacancy rate of about 15 percent. When the price is *not* right, either too many spaces will be empty (the price is too high), or shortages will appear (the price is too low).

Figure 7.3 illustrates this performance-based price for parking (the price at which demand equals the supply of spaces available with a 15 percent vacancy rate). The number of spaces at any site is fixed, so a vertical line positioned at the 85 percent occupancy rate represents the supply curve. The demand curve for parking slopes downward, and the point where this demand curve intersects the vertical supply curve shows the price that will clear the market for spaces. For example, when demand is high (demand curve D_1), a price of \$1 an hour produces a 15 percent vacancy rate (point P_1). When demand is moderate (demand curve D_2), a price of 50¢ an hour produces a 15 percent vacancy rate (point P_2). When demand is low (demand curve D_3), the vacancy rate is 70 percent even with free parking, so the right price of parking is zero (point P_3).

Prices that produce about 85 percent occupancy can be called performance-based for two reasons. First, these prices allow the parking system to perform efficiently. Most spaces are occupied, but drivers can always find a vacant space. Second, these prices allow the whole transportation system to perform efficiently. The parking supply is fixed, but demand rises and falls during the day, so demand-responsive

Figure 7.3 Performance-based parking prices



parking prices will necessarily rise and fall to maintain the desired vacancy rate. Obviously, prices cannot constantly fluctuate to maintain a vacancy rate of *exactly* 15 percent, but they can vary sufficiently to avoid chronic overcrowding or underuse. Drivers who are searching for parking will not congest traffic, waste fuel, and pollute the air.

How will drivers know what to pay if the parking prices vary throughout the day? Electronic parking meters can charge variable prices, and the basic idea is simple. Suppose experience shows the right price to achieve a few vacancies in a lot at the centre of campus is zero from midnight to 6 a.m.; 25¢ an hour from 6 a.m. to 8 a.m.; \$1 an hour from 8 a.m. to 6 p.m.; and 50¢ an hour from 6 p.m. until midnight. If you arrive at 7 a.m. and want to stay three hours, how much money should you put in the meter? The first quarter you insert will give you one hour (until 8 a.m.) Each additional quarter will give you another 15 minutes. So you will have to pay \$2.25 for three hours (25¢ for the first hour, and \$1 an hour for the next two). The meter shows the price of parking during each hour, and you simply get less time for your money at the peak hours. Prices would be lower in lots farther from the centre of campus, but they would still vary throughout the day.

Parking occupancy can be reviewed periodically to see whether prices are producing the target occupancy rate. If a parking surplus or shortage regularly occurs at any time in any location, the price can be adjusted. With newer electronic meters, the parking authority can monitor occupancy rates, remotely reconfigure the price schedules, and send the new rates wirelessly to all the meters on campus. These pricing adjustments will preserve a few vacancies during peak hours, and fill spaces that would otherwise be vacant during off-peak hours. This arrangement differs only slightly from existing meters that have a uniform rate during the daytime and are free at night.

The familiar image of pushing quarters into a parking meter is used only to suggest how much time you get for your money. Electronic pay stations accept payment by credit cards, debit cards, and cell phones. The transactions are cashless so drivers don't have to carry a pocketful of change to pay for parking. Multispace meters can also display information on an interactive screen, including the variable price schedule. The information can be multilingual, include graphics, and guide the user through transactions. New York City, for example, uses multispace meters in Manhattan to charge variable prices of \$2 for the first hour, \$3 for the second hour, and \$4 for the third hour during the daytime, and \$2 an hour during the evenings and on weekends.

A variable price for parking may seem impractical at first, but the price of most commercial parking already varies by time of day and day of the week. Parking lot operators instinctively raise prices when their occupancy rates approach 100 percent, and some operators claim they don't own a 'full' sign because they never need one. To set the prices for campus parking, universities can use the traditional four-step process that commercial operators use to set prices for off-street parking:

1. Look to see if your lot is full or empty.
2. Then check your competition.
3. If you are full and they are empty, raise your price.
4. If you are empty and they are full, lower your price.

Campus parking should *not* be priced like a private parking lot, however, because commercial operators aim to maximize private profits, not social benefits. Nevertheless, this example does show that the price of parking can be adjusted to create a few vacancies everywhere. The purpose of 'right-priced' parking is *not* to gouge drivers or to maximize revenue. Instead, *the right price of parking is the lowest price that will avoid shortages.*

Some cities have adopted this pricing policy for their curb parking. The municipal code of Redwood City, California, for example, succinctly states the goal of parking management:

- A. To accomplish the goal of managing the supply of parking and to make it reasonably available when and where needed, a target occupancy rate of eighty-five percent (85%) is hereby established.
- B. At least annually and not more frequently than quarterly, the Parking Manager shall survey the average occupancy for each parking area in the Downtown Meter Zone that has parking meters. Based on the survey results, the Parking Manager shall adjust the rates up or down in twenty-five cent (\$0.25) intervals to seek to achieve the target occupancy rate.⁵²

Similarly, universities can vary the price of parking to match the quantity of parking demanded with the available supply at each location and time. Prices will be lower in less convenient locations and at off-peak hours, and it can be free whenever and wherever there is excess capacity, such as on weekends and during vacations. Free parking at off-peak hours will encourage students to come to campus during uncrowded times to use the library and athletic facilities, attend plays and concerts, or to take advantage of the many other resources of the university. Why charge students anything to park when the spaces would otherwise remain empty? Free parking at off-peak hours will help to make the campus a livelier and thus safer place at night and on weekends.

Performance-based parking prices will also reveal where expanding the parking supply is justified. If high prices in some locations produce parking revenues that would recover the cost of building a new structure, investment in more parking may be warranted. Similarly, low prices in other locations will reveal where new construction is unwarranted.

Converting Fixed Costs into Marginal Costs

UCLA now allocates parking permits to students either for the quarter or the year. Drivers thus pay an up-front cost for the permit and nothing extra for parking on each trip. The zero marginal cost of parking invites permit holders to drive to campus alone, encourages overuse of scarce spaces during peak hours, and leads to

⁵² Section 20.120 of the Redwood City Municipal Code.

shortages that generate demands for even more campus parking. The permit system works well for conventional commuters who come to campus five days a week and stay on campus all day. The system does *not* work well for students who come to campus only on certain days, who do not remain all day, or who drive to campus only occasionally.

Some universities charge everyone for parking, even those who don't drive to campus. Florida State University and Florida Atlantic University, for example, bundle the cost of a parking permit into tuition payments.⁵³ Parking is free on every day, and because the cost is hidden, students don't know they pay for parking. Even students who are too poor to own a car pay for parking.

Universities that do charge for parking usually give a big discount for monthly permits. At UCLA, for example, the price of parking is \$9 a day or \$63 a month for a permit in 2008–2009. Someone who wants to drive to campus more than 7 days a month thus finds it cheaper to buy a permit, and the marginal cost of parking on campus then becomes zero. For a month with 21 working days, the cost of buying a permit is only 36 percent of the cost of paying per day. Permits are also much more convenient because the users can drive straight into their parking lots, while those without permits must line up at a kiosk to pay every day, and spaces are often not available. Convenient, discounted monthly permits are an invitation to drive to campus alone.

In contrast to selling discounted monthly permits, or bundling the cost of parking with tuition, some universities offer convenient ways to pay for parking on a daily basis. In their survey of university parking policies, Elizabeth Isler, Lester Hoel and Michael Fontaine (2005) found some campuses accommodate the occasional parker without a permit:

The University of Michigan has scratch-off cards that cost \$35 for a 10-pack. Each scratch unit is valid for 1 day of parking, and the user scratches the card to reveal the appropriate date and displays the card in the vehicle's windshield. Other schools such as Utah State University have similar daily permits in the form of punch cards. Day-to-day permits such as this help prevent the 'all you can eat' syndrome that is often enabled by long term permits. If a driver has already paid for a full parking permit, he or she has no incentive not to drive and park every day rather than occasionally using alternative modes... Short-term options such as hourly or daily permits, and a guaranteed ride home program have also been used to fill a niche for the campus user who needs to drive to school occasionally but ends up driving every day because he or she paid for a semester or annual permit or may need a vehicle in the event of an emergency.⁵⁴

The University of Texas has also devised a convenient and cheap Share Pass system to serve alternative transportation users who occasionally want to drive to campus. Customers purchase debit cards and swipe them through a card reader when entering a garage. The Share Passes give users up to a 75 percent discount from the normal

⁵³ Isler, Hoel, and Fontaine (2005, 6).

⁵⁴ Isler, Hoel, and Fontaine (2005, 8–10).

daily rate, but this still exceeds the price for conventional permit holders.⁵⁵ A few universities charge a marginal cost for parking, with no fixed cost. The University of Massachusetts and the University of Wisconsin use in-vehicle parking meters (which resemble debit cards) to pay for parking (Shoup 2005, 387–9). The basic idea is simple: the longer you park, the more you pay. Drivers use these in-vehicle meters to pay for parking on every trip, and they pay only for the exact time they use – no more, no less. This system encourages commuters to consider alternatives to solo driving for each trip because they can save money by carpooling, riding transit, bicycling, or walking.

The structure of parking prices at airports provides an example of what performance-based prices on campus could look like. Everyone expects not only to pay for parking at airports, but also to pay higher prices for parking closer to the terminals. The expensive central spaces encourage short-term parking and carpooling, while the cheaper remote spaces attract long-term parkers and solo drivers. Many passengers use public transportation or shared-ride vehicles to get to and from the airports specifically to avoid paying for parking (which, incidentally, has become a major source of income for airports). Similarly, once people have become accustomed to performance-priced parking on campus, the idea of going back to administered parking will seem as absurd as expecting free parking at airports (desired, perhaps, but understood to be neither realistic nor ultimately beneficial).

Low Cost of Administration

Letting prices manage parking will take a heavy burden off university administrators who now devote endless hours debating how to micromanage parking for faculty, staff, and students. Even higher political bodies, all the way up to the President's Cabinet in Washington, waste time talking about parking, as suggested by this description of a cabinet meeting in which Daniel Patrick Moynihan participated: 'a cabinet meeting which was mainly bitching about parking in federal buildings – all right, it was supposed to be about office space, but it was also about parking, it always is.'⁵⁶ What Joseph Schumpeter said about politics in general applies perfectly to the politics of parking in particular: 'The typical citizen drops down to a lower level of mental performance as soon as he enters the political field. He argues and analyzes in a way which he would readily recognize as infantile within the sphere of his real interests.'⁵⁷ If universities let prices allocate parking, everyone will be able to spend more time dealing with academic issues.

Parking Cash Out

Parking cash out is another way to reduce the demand for campus parking. Faculty members at many universities pay nothing for parking, and it may be politically

⁵⁵ Stone (2005, 26). Information about the Share Pass is available online at <<http://www.utexas.edu/parking/parking/utsharepass/>>.

⁵⁶ Takesuye (2001, 36.).

⁵⁷ Schumpeter (1942, 262).

impossible to begin charging them. In this case, a program of parking cash out – offering employees the option to choose the cash value of any parking subsidy offered, in lieu of the parking itself – can achieve almost the same efficiency gain as charging for parking, but without the political pain. Consider the cash-out program run by the Pfizer Corporation at its laboratories in Kent, England. Pfizer estimates that the capital and operating cost of providing parking for its employees is more than £1 million a year, and that the average cost per space is £2 a day.⁵⁸ Under the program, employees can park free at work on any day, but any commuter who works on site without bringing a car receives a credit worth £2. Commuters can either park free or take the cash value of the parking, and they can make different choices on different days. Although everyone can park free, commuters who drive to work alone forfeit £2 a day. The daily cash option therefore encourages every commuter to consider the alternatives to solo driving whenever possible.

The program is simple. Employees automatically earn a credit of £2 each day when they use their company identification cards to enter their office building. If they have driven to work, they use the same identification cards to access the company parking lot, and £2 is deducted from their account.⁵⁹ A solo driver thus receives both a credit and a debit of £2 for the day (so the net value is zero), but a commuter who has walked, biked, or taken the bus to work receives a net credit of £2 for the day (because there is no debit for parking). These accumulated credits are forwarded to the payroll office at the end of the month, and the cash value is included in each employee's salary one month in arrears. This arrangement automatically enrolls all employees in the program even if they usually drive to work alone.

Daily parking cash out is fair and flexible for both the firm and its employees. Giving a credit for arriving and then deducting it for parking informs every commuter, every day, that parking has a cost. Commuters can earn a cash bonus on any day simply by showing up at work without a car. Rather than charge commuters to park, the firm pays them not to park. This policy levels the playing field among all modes of travel because all commuters receive the same subsidy, regardless of their mode choice. Parking cash out does not favour the alternatives to solo driving, but instead offers the same subsidy to drivers and nondrivers alike – a parking subsidy

58 Pfizer is the world's largest pharmaceutical company. Sandwich is a coastal town on the English Channel, 70 miles east of London. The consulting firm of John Whitelegg and Associates designed the cash-out program for Pfizer. The cash value of a parking space is based on the capital cost and on operating costs for security, maintenance, planting, and lighting. The cash-out program began in June 2001, and is described in the brochure, 'Check-In, Cash-Out,' available from Pfizer Global Research and Development in Sandwich, Kent, England. The program is also described in UK Department of Transport (2002).

59 Pfizer keeps a record of each commuter's credits and debits; the charge for parking is deducted when a card activates the exit barrier as a driver leaves the company parking lot. Charges are deducted only when a car passes through the exit barrier for the first time during the workday; subsequent exits from the car park using the same identification card do not register any further deductions, so drivers can leave and return during the day without charge. An alternative policy is to offer each employee a monthly transportation allowance, and to deduct a payment for parking on each day a commuter uses an access card to enter the firm's parking facility; the money that is not used for parking can be taken in cash at the end of the month.

for drivers and a cash subsidy for nondrivers. This seems generous to nondrivers only because most employers offer nondrivers nothing.

The daily parking cash-out arrangement is particularly well suited to universities. Some professors argue that charging for parking discourages coming to campus, while free parking encourages the faculty to make themselves available to meet with students, attend committee meetings, and participate fully in the life of the university. In this situation, daily parking cash out serves everyone's interest. Professors who drive to campus can park free, while those who come to campus without a car receive the cash value of the parking they do not use. Even economics professors can have a free lunch if they forgo a free parking space, and professors who stay at home receive nothing. What could be fairer or more efficient?

Parking Fee Level versus Parking Fee Structure

The daily cash-out option illustrates a key distinction between the *level* and the *structure* of parking fees. The level of the fee refers to the amount, while the structure refers to the way drivers pay it (per hour, day, or month). A fee of \$5 a day and \$100 a month both amount to the same charge for 20 working days a month, but drivers react differently to a daily fee than to a monthly one. Drivers will often respond more to a change in a parking fee's structure than to a change in its level. Imagine, for example, that the price of a parking permit is \$100 a month. If a commuter wants to drive to work twice a week (for example, to run errands at lunch or after work), then the rational decision may be to buy a parking permit. With a permit, the marginal cost to park at work on any given day is zero. Once you have bought your car, paid for your insurance, and have a parking permit, why not drive? As a result, commuters are more likely to drive to work *every* day. If the permit price increases to \$110 a month, most commuters will continue driving to work, so the higher price will do little to reduce vehicle trips.

Now suppose the fee level remains \$100 a month, but the structure is changed to include the option of paying \$5 per day (the collection can be automated with electronic payments to avoid any inconvenience for the drivers). In this case, commuters need not buy a permit for an entire month. Instead, they can pay only for the days when they drive to work. On other days, they can ride transit, carpool, walk, or bicycle to work and save the \$5 daily fee. Offering the option of a daily fee will increase the number of commuters who drive only a few days each month, and reduce the number who drive every day. In this way, restructuring the fee without increasing its level can reduce the number of vehicle trips by giving commuters new options.

Another benefit of offering the daily fee option is that employees won't oppose it. Raising a parking fee from \$100 to \$110 a month, for example, can arouse strong opposition but only slightly reduce solo driving. In contrast, adding the option to pay \$5 a day can reduce solo driving but arouse no opposition because it does not increase the monthly cost for someone who drives every day. Pfizer's daily cash-out program does not increase the price of parking, is popular with employees, treats full-time and part-time drivers equally, and provides a financial incentive for everyone to rideshare, every day.

With performance-based prices, drivers who choose parking locations to reduce their individual costs will park in a pattern that also reduces the total cost of time spent walking to and from the parked cars. Why? Because the performance-based prices will allocate the central spaces to carpools, short-term parkers, and those who place a high value on saving time, for three reasons.⁶⁰ First, because carpoolers split the cost of parking among two or more people, they are less sensitive to parking prices and will therefore use the more central spaces. Second, because short-term parkers pay for only a few minutes, they are also less sensitive to parking prices and will also use the more central spaces. Third, those who place a high value on saving time will use the more central spaces because the time they save outweighs the higher cost.

Drivers may have different destinations on campus on different days, and they can park in different locations on different days. Those who want to spend only a short time on campus – such as for a quick trip to the library – will not have to spend a long time walking from their assigned parking spaces to their final destinations. The faster turnover of the central parking spaces will make them available to more people.

If parking prices increase toward the centre of campus, will rich drivers monopolize the central parking spaces? All else equal, drivers who place a high value on saving time will pay more and walk less, but time value is only one of several factors that determine the optimal parking location. Because parking duration and the number of people in a car also affect location choice, drivers who place a high value on time will not automatically park in the best parking spaces. Many other factors affect how much drivers are willing to pay to save walking time on any particular trip: whether they are late or tired, the weather, the scenery, safety, heavy packages they are carrying, whether they want the exercise, their health, and other circumstances that are unique to each trip. The value of saving time can vary greatly from one place to another, from one person to another, and from one trip to another. An old Ford may park in an expensive space at the centre of campus if its driver is in a hurry and plans to stay for only a few minutes, while a new Bentley may park in a cheap space at the periphery if its driver has plenty of time, enjoys walking, and plans to stay all day. To allay equity concerns, any extra revenue that results from higher prices for the central spaces can be used to pay for alternative forms of transportation, such as fare-free public transportation for students, staff, and faculty.

Fare-Free Public Transportation at Universities

Many American universities contract with the public transit agencies in their cities to offer fare-free public transportation for everyone at the university. Universities have given their transit programs a variety of names – such as UPass, ClassPass, and BruinGO – but they are often referred to by the generic name of Unlimited Access.

⁶⁰ In linear-programming terms, the user-optimizing solution is the same as the system-optimizing solution. Shoup (1999) analyzes how market-clearing prices will allocate parking spaces efficiently.

Unlimited Access programs turn university identification cards into public transit passes. The university pays the transit agency an annual lump sum based on expected student ridership, and the transit agency accepts the university's identification cards as transit passes. For every eligible member of the university on any day, a bus ride to campus (or anywhere else) is free. Unlimited Access is not free transit, but is instead a new way to pay for public transit.

UCLA's partnership with the Santa Monica Big Blue Bus, called BruinGO, has proved to be a great success for both the university and the community. During BruinGO's first year, transit ridership for commuting to campus by faculty and staff who live within the Blue Bus service area increased by 134 percent, while ridership was almost unchanged outside the Blue Bus Service area (Brown, Hess, and Shoup 2003). Even larger increases in transit ridership have been reported at other universities with Unlimited Access programs (Brown, Hess, and Shoup 2001). BruinGO increases transit ridership, reduces parking demand, reduces traffic, and also provides two other important benefits for the university: financial aid for students, and a tax-exempt fringe benefit for staff and faculty. Seventy-six percent of student BruinGO riders receive financial aid from the university, so free public transit isn't just another perk for people who don't need it. For these students, the fare subsidies effectively increase their financial aid packages. Using the revenue from campus parking to fund a fare-free public transportation program should thus allay most fears that performance-based parking prices will, on balance, harm low-income students.

Table 7.1 Faculty/staff bus share for commuting

	Blue Bus Service Area	
	Inside	Outside
Before BruinGO	8.6%	7.2%
With BruinGO	20.1%	7.6%
Difference	11.5%	0.4%
Percent change	134%	6%

Source: Crain and Associates (2002, Tables 3 and 4).

Transportation Prices Turned Upside Down

Pay-as-you-park pricing for drivers combined with fare-free public transportation for transit riders will change the price of travel in two important ways. First, the price of parking will switch from a fixed cost per month with no marginal cost to a marginal cost per hour with no fixed cost. Second, the price of public transportation will fall from a marginal cost per trip to nothing. The increased marginal cost of parking will reduce vehicle trips, and the reduced marginal cost of using public transportation will increase transit ridership. Taken together, these two price reforms will reduce vehicle travel much more than either one acting alone because in combination they will turn transportation prices upside down.

Conclusion: Let Prices Do the Planning

In *The Public Use of Private Interest*, Brookings Institution economist Charles Schultze wrote 'Harnessing the "base" motive of material self-interest to promote the common good is perhaps *the* most important social invention mankind has yet achieved...[But] the virtually universal characteristic of public policy...is to *start* from the conclusion that regulation is the obvious answer; the pricing alternative is never considered.'⁶¹ Campus parking policies based on regulations rather than prices are a perfect example of Schultze's argument. Is there a better way to manage campus parking – a lower cost alternative that is fair, efficient, and does not encourage rampant cheating? A system that relies on incentives rather than on penalties to encourage honest behaviour? There is, and some universities already use it: they charge higher prices for the more desirable parking spaces, and they charge users by the hour rather than by the month or year. In short, they rely more on the market and less on bureaucracy.

Pilot Program

Universities can use a pilot program to test performance-based parking prices that vary by time and location. Offering a pilot program for a sample of a few hundred students, staff, and faculty will show how drivers respond to the new option, and how much revenue it produces. If performance-based prices provide better service and produce more revenue than conventional permits for the spaces used by the pilot project, the pay-as-you-park option can be expanded incrementally. The results of the pilot project can be carefully evaluated before proceeding to more widespread adoption. So long as the new revenue from performance-priced parking replaces the lost revenue from conventional permits, the university will lose nothing from the shift. A pilot program could be used to test whether performance-priced parking produces these 12 benefits:

1. The system will be transparent and will treat everyone equally.
2. All students will be eligible to park on campus, not just students who manage to obtain a conventional parking permit.
3. The administration will not need to judge whether a student 'needs' parking.
4. By encouraging faster turnover and higher vehicle occupancy for the better-located parking spaces, the existing parking supply will serve more people.
5. If performance-priced parking increases total revenue, the extra money can pay for alternative transportation, such as fare-free public transit, that benefits the poorest students.
6. Drivers will pay only for the parking time they use – no more and no less.
7. Charging drivers for the time they park will encourage everyone to consider alternatives to solo driving for every trip to campus. Anyone can always save money by carpooling, riding public transit, bicycling, or walking.

61 Schultze (1977, 18 and 47).

8. Drivers will have more flexibility. They can pay a higher price to park in the more central spaces when they are in a hurry, when they want to park for a short time, or when they carpool. They can save money by parking in the cheaper, peripheral spaces when they are willing to walk farther, want to park all day, or drive solo. Students, staff, and faculty can park free on campus at off-peak times when demand is low.
9. Areas where high parking demand leads to high parking prices will signal where new parking structures should be built. Similarly, areas where low demand leads to low prices will signal where parking structures should *not* be built. Performance-based prices will create a dynamic, self-correcting parking system and will help to guide the allocation of scarce land and capital.
10. Lower off-peak prices will draw students to campus during the summer, in the evenings, and on weekends when the university has empty parking spaces waiting to be used. Populating the campus at off-peak times will make it livelier and safer for everyone.
11. Drivers with disabilities can be offered transportation allowances to park in the best-located spaces, enhancing their access to the campus and their overall mobility.
12. Highly-recruited students can be offered transportation allowances to be used for parking on campus or for any other purpose. By rewarding academic or athletic excellence, for example, the transportation allowances can further the academic and other missions of the university.

This experiment could have one result that might cause parking administrators to oppose a pilot program. The campus parking service may lose revenue from faculty, staff, and students who now buy monthly permits but drive to campus only occasionally. These people would be likely to jump at the chance to pay only for the parking they use, rather than to pay for a whole month. In effect, the permit holders who drive occasionally would no longer subsidize the permit holders who drive every day. Parking administrators may hesitate to offer convenient daily parking if they fear that occasional drivers would give up their monthly permits and pay only for the parking they use. Any pilot program should examine both increases and decreases in parking use and revenue.

The Lessons for Cities

Big universities resemble small cities, and the innovations in transportation demand management at universities provide important lessons for transportation demand management in cities. To reduce automobile dominance on campus, a growing number of universities have reformed their pricing policies for both campus parking and public transportation.

To manage the parking supply, some universities adjust parking prices by zone and time of day to balance supply and demand for parking at each location. In lieu of conventional parking permits, some universities also use in-vehicle meters so that drivers pay for parking by the hour rather than by the month. These performance-based parking prices favour high-occupancy vehicles and short-term parkers,

accommodate occasional users, create more opportunities for individual choice, and reduce vehicle travel.

Universities have also pioneered another strategy, Unlimited Access, to reduce automobile travel. They contract with their local public transit operators so their university identification cards serve as transit passes for everyone at the university. Paying the fare for a bus ride to campus is far cheaper than building a parking space on campus, and avoiding the expense of new parking spaces is thus a major benefit of fare-free public transit. Unlimited Access programs allow universities to satisfy their transportation demand with a smaller parking supply, and at much lower cost.

Performance-based parking prices can manage travel demand, but are they fair? At universities, it seems fair that carpoolers, short-term users, and well-paid senior administrators pay a higher price to park in the most convenient spots in the centre of campus while solo-drivers, long-term users, and financially-challenged students pay a much lower price to park at the periphery – especially if the university spends the revenue earned by the higher-priced central spaces to finance fare-free public transportation for everyone at the university. Similarly, in cities it seems fair to charge higher prices for curb parking in the centre of business districts than in the more distant spaces – especially if the city spends the revenue to reduce the price of public transportation.

With both performance-based parking prices and Unlimited Access programs, universities are leading the way for the rest of society. Some cities already set a goal of about 85 percent occupancy for curb parking in their central business districts, and instruct their parking authorities to adjust meter rates to achieve this goal. Similarly, some transit agencies already offer private employers the option to enter into fare-free public transportation contracts that cover all their employees. Performance-priced parking and Unlimited Access programs, which are appropriate for so many different settings, can contribute to many important goals of transportation demand management: traffic reduction, clean air, energy conservation, and sustainable cities. Few other transportation reforms contribute to so many goals, produce such easily quantifiable benefits, and have such low costs. All these benefits accrue simply by following the age-old axiom in public economics: get the prices right.

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APPENDIX A: EXCERPTS OF CORRESPONDENCE ABOUT THE POINT SYSTEM

Chair of Faculty Welfare Committee to Director of Parking Services, July 17, 1996:

[Please explain] how the point system operates—including what happens after a student submits an application. For example,

How do you check the information on the permit applications?

What percent of permit applications are found to contain misrepresentations?

How do you deal with instances of misrepresentation on permit applications?

Director of Parking Services to Chair of Faculty Welfare Committee, August 14, 1996:

In past audits, 10-15% of students were found to have provided falsified information.

Chair of Faculty Welfare Committee to Director of Parking Services, September 18, 1996:

You mention that in past audits, 10 to 15 percent of students were found to have provided falsified information. Can you please tell me the *absolute number* of students who provided falsified information, per year? Also, can you tell me what happens to these students?

Director of Parking Services to Chair of Faculty Welfare Committee, October 7, 1996:

In regard to the consequences students face for falsifying information on their parking applications, students who are unable to provide the documentation required by the auditor may lose their parking assignments and/or have their parking privileges revoked for an extended period of time.

Chair of Faculty Welfare Committee to Director of Parking Services, October 24, 1996:

You mention that in past audits, 10 to 15 percent of students were found to have provided falsified information. If only for the past year, can you please tell me the *absolute number* of students who provided false information and the *absolute number* of students who had their parking privileges revoked for an extended period of time?

Director of Parking Services to Chair of Faculty Welfare Committee, December 10, 1996:

Due to systems problems with our parking permit database, we did not conduct an audit last year. Therefore, we are unable to provide you with last year's number of students who provided falsified information on their parking applications. We will search for the files over the holiday period when our staff can devote the time necessary to do so.

Chair of Faculty Welfare Committee to Director of Parking Services, January 9, 1997:

You mentioned in your memo of December 10 that you would try to find the past years' records for the number of students who have had their parking privileges revoked because of misinformation on their parking permit applications. If this information is available, I would appreciate receiving it.

Director of Parking Services to Chair of Faculty Welfare Committee, January 30, 1997:

Unfortunately, a number of Parking and Commuter Services staff were out ill during the holiday period, so we were unable to conduct a file search of our off-site files for information related to earlier years' student audits. We plan to do so as soon as possible.

Chair of Faculty Welfare Committee to Director of Parking Services, September 3, 1997:

I am attaching a memo I wrote on October 24, 1996, regarding the results of previous parking audits. I would still appreciate receiving the two pieces of information requested.

Director of Parking Services to Chair of Faculty Welfare Committee, September 25, 1997:

We have again searched our off-site storage locations and, unfortunately, it appears that the results of earlier years' student audits were among the boxes of files completely destroyed by flooding in the lower level of Parking Structure 4 a couple of years ago.

Chair of Faculty Welfare Committee to Director of Parking Services, October 1, 1997:

I am disappointed to learn that no records are available, not even on computer files, but I understand that accidents happen. Are disciplinary actions for false information on permit application violations forwarded to the Dean of Students? If so, perhaps I could contact their office to get the records. Please tell me whom to call in the Dean's Office if you think I can get the information there.

Director of Parking Services to Chair of Faculty Welfare Committee, November 6, 1997:

The Dean of Students Office says they do not have such records.

END

APPENDIX B: ABUSE OF PARKING DECALS BY FACULTY AND STAFF

Each UCLA parking permit holder receives one permit decal that must be displayed in the windshield when a car is parked on campus. To avoid the inconvenience of moving a single decal between two vehicles owned by one permit holder, UCLA formerly offered faculty and staff who own two registered vehicles the option to receive a decal for each vehicle. Two-decal permit holders were required to sign a statement that only one vehicle would be parked on campus at a time unless a per-entry parking fee was paid to park the second vehicle. The suspicion that some faculty and staff were using one permit to park two cars on campus at the same time led the Parking Service to request an audit of the problem.

Audits

In 1989 UCLA's Internal Audit Department conducted a special review to estimate how many two-decal holders parked two vehicles on campus at the same time without paying for the second vehicle (*Parking Service Special Review 90-201507*).⁷³ The audit had two phases. In Phase 1, auditors examined the records for a sample of 600 two-decal permit holders (8 percent of the 7,437 two-decal permit holders). Auditors obtained the permit holders' vehicle license numbers from their parking applications, obtained DMV reports for these license numbers, and compared the two data sets. The auditors discovered serious problems:

Information on 42 percent of all two-decal permit holders' UCLA parking applications differed from the corresponding DMV reports.

Of all two-decal permit holders, 31 percent had only one vehicle registered in their name.

The second vehicle of 24 percent of all two-decal permit holders was registered to a person who neither appeared to be a relative nor resided at the employee's address.

For 11 percent of all two-decal permit holders, neither vehicle was registered in the employee's name, no license number could be located by the DMV, or the Parking Service could not find the permit application.

In Phase 2, auditors recorded the license numbers and permit information for all the vehicles parked in Structure 2 on December 14 and Structure 8 on December 6, 1989. The goal was to estimate how many cars were parked using two decals for the same permit at the same time. The auditors discovered even more problems:

Five percent of the cars in both Structures 2 and 8 were using two decals issued for the same permit. Because auditors performed sweeps of only one parking structure at a time, the auditors could not detect instances where they parked vehicles with the same permit in other parking structures or lots at the same time. The audits therefore seriously underestimated the frequency of parking two vehicles on campus without paying for the second vehicle.

Forty-three decals that had been reported lost or stolen were found in use.

Sixteen of these 43 lost-or-stolen decals were being used in the same structure at the same time with the replacement decals.

In two cases, *three* decals for the same permit were being used in the same structure at the same time. In both cases the permit holders had been issued a replacement decal when one of their two original decals had been reported lost or stolen.

Because of these abuses, UCLA increased the price of a second decal to \$72 a year to compensate for the revenue lost from their abuse. The higher price did not stop abuse, of course, but instead made the purchase of second decals a sensible choice mainly for those who intended to abuse them. The Parking Service estimated that at least 23 percent of those who purchased a second decal parked two cars on campus at the same time, and in 1999 it eliminated the option of second parking decals for faculty and staff.

Ethics

Why did UCLA end the second-decal privileges for faculty and staff but continue to use the corrupted and corrupting point system for students? The answer is simple. When faculty and staff abused their second decals, they reduced the Parking Service's revenue. When students abuse the point system, they merely jump the queue for parking permits without costing the Parking Service anything. Abuse of second decals is apparently more important than abuse of the point system because money is more important than ethics. For a commercial enterprise, the priority of revenue over ethics might make sense. For a university, however, ethical considerations require reforms beyond simply eliminating second parking decals for faculty and staff.

What kind of liar are you?

People lie because they don't remember clear what they saw.

People lie because they can't help making a story better than it was the way it happened.

People tell "white lies" so as to be decent to others.

People lie in a pinch, hating to do it, but lying on because it might be worse.

And people lie just to be liars for a crooked personal gain.

What sort of liar are you?

Which of these liars are you?

CARL SANDBURG