DRIVING IN CIRCLES

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My father didn't pay for parking, my mother, my brother, nobody. It's like going to a prostitute. Why should I pay when, if I apply myself, maybe I can get it for free? George Costanza

Most people think about traffic with a mixture of rage and resignation. Rage because congestion wastes valuable time, and resignation because what can anyone do about it? People have places to go, after all, and congestion seems inevitable.

But a surprising amount of traffic isn't caused by people who are on their way somewhere. Rather it is caused by people who have already arrived. Our streets are clogged, in part, by people who have gotten where they want to be and are cruising around looking for a place to park.

CRUISING FOR PARKING

Perhaps because cruising is a disguised source of congestion, most transportation planners and engineers have ignored it. Cruising creates a mobile queue of cars waiting for curb vacancies, but cruisers are mixed with traffic that is going somewhere, so no one can see how many cars are cruising queue. Nevertheless, a few researchers have analyzed videotapes of traffic flows, interviewed drivers who park at the curb, or driven test cars in search of parking to estimate how long it takes to find a curb space and how much traffic is cruising for parking. Sixteen studies of cruising behavior were conducted between 1927 and 2001 in the central business districts of 11 cities on four continents (see Table 1). The average time it took to find a curb space was 8 minutes, and about 30 percent of the cars in the traffic flow were cruising for parking. The data varied widely around these averages, however. On some uncrowded streets no cars were cruising, but on some congested streets most of the cars were cruising.

Table 1. Cruising

Cities have changed since these observations were made, and the data are selective because researchers study cruising only where they expect to find it. Nevertheless, cruising itself has not changed, and the studies show that cruising for parking has wasted time and fuel for many decades. Because a vacant curb space is hard to find on the busiest streets of most cities, the sun never sets on cruising.

Even a small search time per car can create a surprising amount of traffic. Consider a congested downtown where it takes three minutes to find a curb space and the parking turnover is 10 cars per space per day. For each curb space, cruising thus results in 30 extra minutes of vehicle travel per day (3 minutes x 10 cars). If the average cruising speed is 10 miles an hour, cruising creates 5 vehicle miles traveled per space per day (10 mph x 0.5 hour). Over a year, this driving in circles amounts to 1,825 VMT for each curb space (5 miles x 365 days), greater than half the distance across the United States. Where cruising for curb parking adds to traffic that is already congested, it makes a bad situation even worse.

TWENTIETH CENTURY CRUISING

Year	City	Share of traffic cruising (percent)	Average search time (minutes)
1927	Detroit (1)	19%	
1927	Detroit (2)	34%	
1933	Washington		8.0
1960	New Haven	17%	
1965	London (1)		6.1
1965	London (2)		3.5
1965	London (3)		3.6
1977	Freiburg	74%	6.0
1984	Jerusalem		9.0
1985	Cambridge	30%	11.5
1993	Cape Town		12.2
1993	New York (1)	8%	7.9
1993	New York (2)		10.2
1993	New York (3)		13.9
1997	San Francisco		6.5
2001	Sydney		6.5
Average		**30%**	**8.1**

If curb parking is cheaper than off-street parking, cruising to find a curb space is rational for individual drivers. Collectively, however, cruising congests traffic, wastes fuel, and pollutes the air. Cities cause all these problems when they underprice curb parking.

CHOOSING TO CRUISE

Suppose curb parking is free but all the spaces are occupied, so you have to cruise until you find a space being vacated by a departing car. Off-street parking is available but you have to pay the market price for it. How do you decide whether to cruise or to pay?

When cruising for free parking on crowded streets, we rarely think about how we ended up in this mobile purgatory, but we are simply responding to prices. Cities create the incentive to cruise by underpricing curb parking. To examine this incentive, I collected data on the price of curb and off-street parking for an hour at noon at the same location—City Hall—in 20 cities throughout the United States. The average price of curb parking was only 20 percent of the price of parking in a garage. Cruising saved drivers most in New York, where the price of off-street parking was $14.38 for the first hour, but curb parking was only $1.50.

Figure 1. Price of parking at City Hall

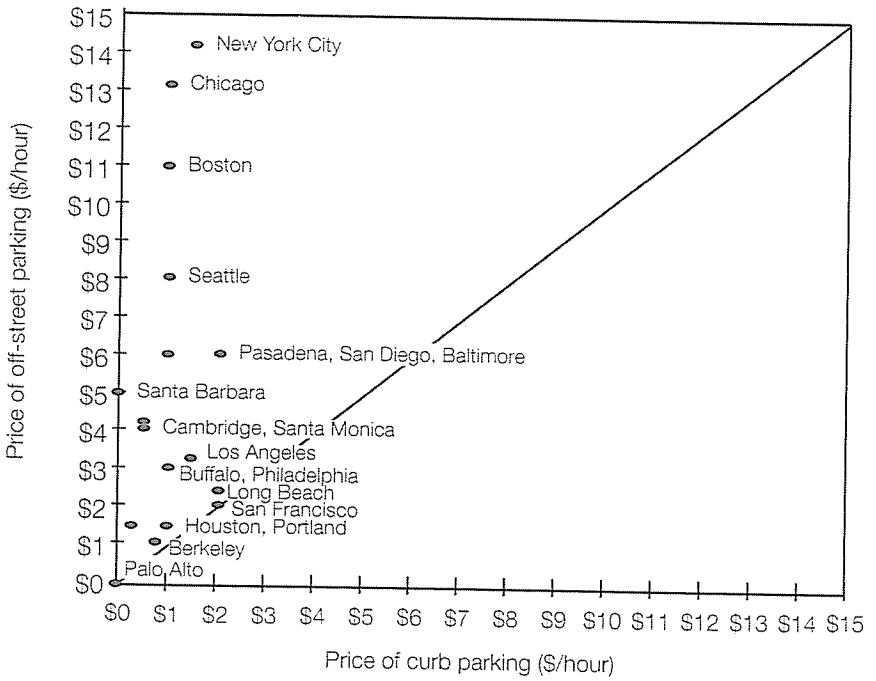
Consider the high price of off-street parking in downtown Boston ($11), which stems in part from the city's cap on the number of off-street parking spaces. The parking inventory is frozen at its 1975 level. This supply cap drives up the market price of off-street parking and produces a bad outcome: combined with the low price of curb parking, the high price of off-street parking increases the incentive to cruise. Boston limits the private off-street parking supply, but fails to charge the market price for its own public curb parking. A survey in 2006 found the average price for off-street parking in the Boston CBD was $31 a day. In contrast, Boston charges a flat rate ($1 an hour) for all metered parking spaces in the city. Instead of using prices to manage the demand for curb parking, Boston grossly underprices curb parking and encourages drivers to cruise.

Boston's off-street parking cap makes sense as a way to reduce congestion on routes *to* the city, but the failure to follow through with market prices for curb parking increases congestion *in* the city. Everyone would criticize off-street parking operators if long lines of cars regularly spilled into the streets and snarled traffic because the lots and garages were always full. Cities create the same result with underpriced curb parking, but nobody notices because the cruising cars are hidden in the general traffic flow.

CRUISING IN WESTWOOD

To find out more about cruising, my students and I made 240 observations of how long it takes to find a curb parking space at four sites in Westwood Village, a commercial district next to the UCLA campus. Curb parking in metered spaces was only 50 cents an hour during the day and was free in the evening, while the cheapest off-street parking was $1 an hour. For each observation

The Price of Parking at City Hall (for parking one hour at noon on a weekday)



we drove to the site and then circled the block until we found a curb space. Because the curb spaces were occupied almost all the time, we rarely found a vacant space when we arrived. Instead, we usually searched until we found a parked car about to vacate a space, and then waited for it to leave.

Most drivers who are cruising for parking try to avoid following directly behind another car that appears to be cruising, so as to maximize the chance of being the first to see a vacant spot. Driving a car to measure cruising times may therefore influence the behavior being studied. To avoid this potential pitfall and to get some exercise, we decided to make most of the observations by riding bicycles. The average cruising speed by car in Westwood is only 8 to 10 miles an hour because every intersection has a stop sign or traffic light, so a cyclist can easily keep up with the vehicle traffic. For the tests, we equipped each bicycle with a cyclometer to measure elapsed travel time, distance traveled, and average speed. We rode as if we were motorists in traffic that was moving or waiting to move, so the search time by bike closely approximated the cruising time by car.

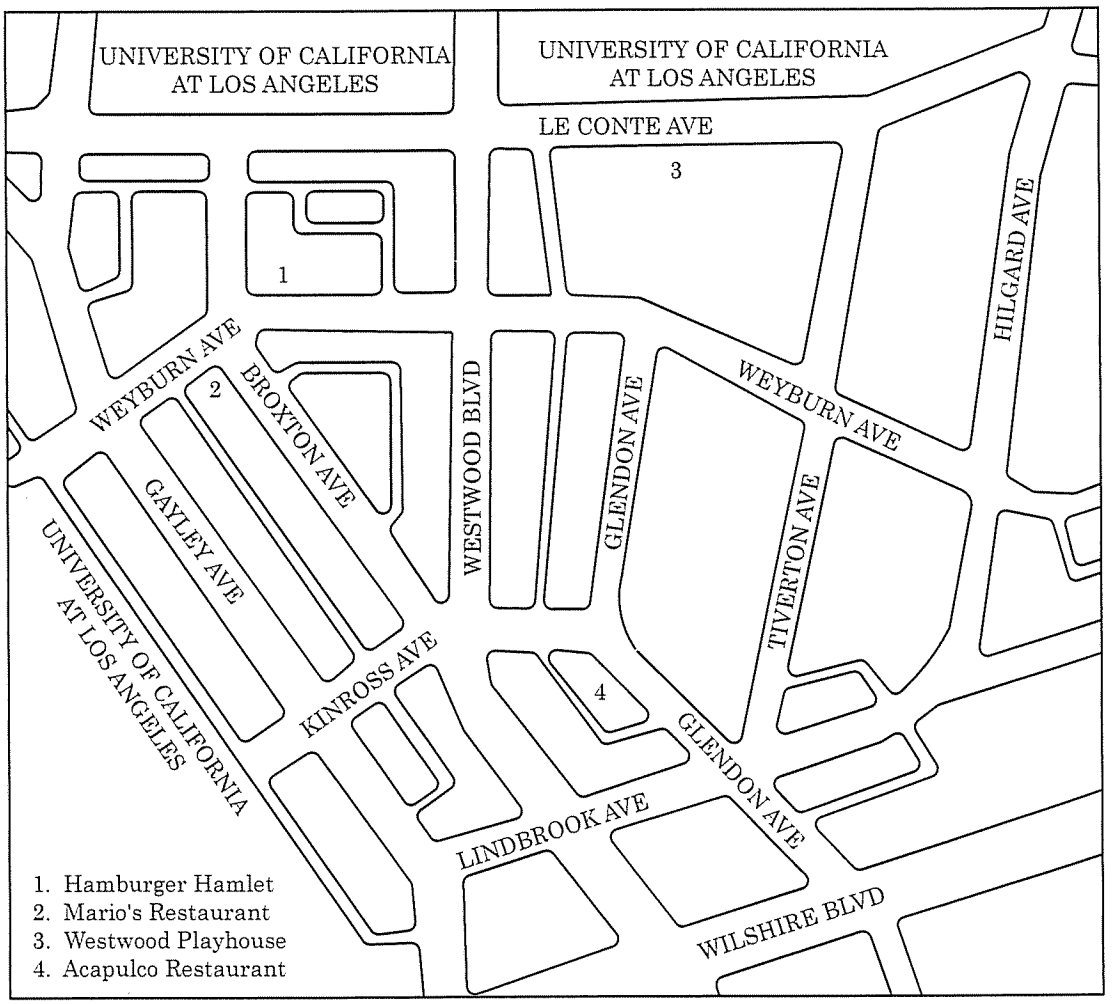
Figure 2. Westwood Village

The average cruising time to find a curb space was 3.3 minutes, and the average cruising distance was half a mile (about 2.5 times around the block). The small distances cruised by each driver add up quickly because the turnover rate for curb parking was 17 cars per space per day. With 470 metered parking spaces in the Village, almost 8,000 cars park at the curb each day (17 x 470). Because so many cars park at the curb, a short cruising time for each driver creates an amazing amount of traffic. Although the average driver cruises only half a mile before parking, cruising around the 15 blocks in the Village creates almost 4,000 VMT every weekday (8,000 x 0.5).

Over a year, cruising in Westwood Village creates 950,000 excess VMT—equivalent to 38 trips around the earth, or four trips to the moon. The obvious waste of time and fuel is even more appalling when we consider the low speed and fuel efficiency of cruising cars. Because drivers average about 10 miles an hour in the Village, cruising 950,000 miles a year wastes about 95,000 hours (11 *years*) of drivers' time every year. And here's another inconvenient truth about underpriced curb parking: cruising 950,000 miles wastes 47,000 gallons of gasoline and produces 730 tons of CO_2 emissions in a small business district.

THE RIGHT PRICE FOR CURB PARKING

When drivers compare the prices of parking at the curb or in a garage, they usually decide that the price of garage parking is too high, but in fact the reverse is true. The price of curb parking is too *low*. Underpriced curb spaces are like rent-controlled apartments: they are hard to find, and once you find a space you'd be crazy to give it up. This makes curb spaces even harder to find, and increases the time costs (and therefore the congestion and pollution costs) of searching for them. Like rent-controlled apartments, curb spaces go to the lucky more than to the deserving. One person might find a curb space and park there for days, while others who are late for a meeting or a job interview are left to circle the block, making themselves—and other drivers—miserable.



WESTWOOD VILLAGE

The right price for curb parking can eliminate cruising. The top panel of Figure 3 shows a typical commercial block where curb parking is underpriced and all the curb spaces are occupied. The average block has eight curb spaces on each side, the average cruising time before finding a curb space is 3.3 minutes, and two cruisers are circling each block.

Figure 3. Two blocks

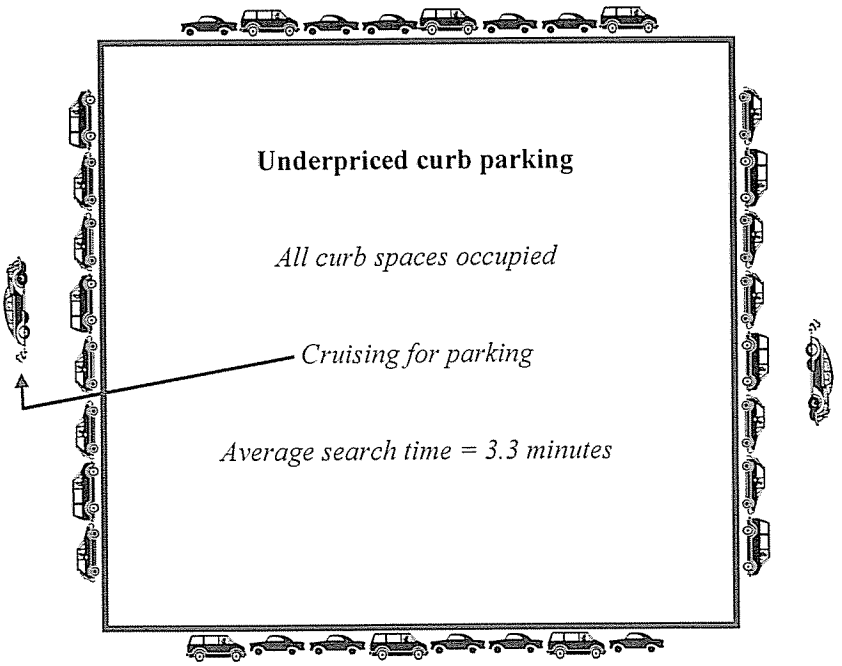
In contrast, the bottom panel shows what happens if a city charges the lowest price that will produce a few vacant spaces. Drivers have no reason to cruise because they can always find a vacant curb space near their destination, and the search time is therefore zero. The city can adjust the prices of curb parking in response to demand to keep roughly one out of every eight spaces vacant throughout the day. Underpriced curb parking creates an astonishing amount of cruising, and right-priced curb parking can eliminate cruising.

Only trial and error will reveal the right price for curb parking. Initially, if all the curb spaces are always occupied, a city might raise the meter rate by 25¢ an hour every month until occupancy is about 85 percent during an hour. During other hours when the spaces are still full, the meter rates would continue upward until the occupancy is about 85 percent at all hours. We can call this balance between the varying demand for parking and the fixed supply of curb spaces 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 only a few spaces are vacant, the price is just right, and everyone will see that curb parking is both well used and readily available.

Pricing curb parking to ensure a few vacancies does not mean that travel will become unaffordable. Drivers can use several strategies to economize on curb parking without reducing their travel. They can (1) travel at off-peak hours when curb parking is cheaper, (2) park where prices are lower and walk farther to their destinations, (3) park for a shorter time, (4) park off-street, (5) carpool and split the cost of parking, or (6) take public transit, ride a bike, or walk all the way to their destinations. Diverting some trips to carpools, public transit, cycling, and walking will reduce *vehicle* travel without reducing *human* travel, and all real travel is by people, not cars.

CRUISING IN MANHATTAN

To understand the compulsion to cruise, consider two side-by-side restaurants that serve identical food. One charges $20 for dinner and seating is always available. The other charges $1 for the same dinner but everybody has to stand in a line stretching around the block. Cities create a similar choice when they underprice curb parking. Figure 4 shows the prices for off-street parking and the adjacent curb parking on a street in midtown Manhattan. The price for the first hour of off-street parking is $20 (= $16.90 + $3.10 in tax). A driver who wants to park for an hour can pay either $20 off-street or $1 at the curb. Parking at the curb saves $19, but drivers first have to cruise to find a space. By underpricing its curb parking, New York City invites motorists to waste fuel, congest traffic, and pollute the air.


Underpriced curb parking
All curb spaces occupied
Cruising for parking
Average search time = 3.3 minutes

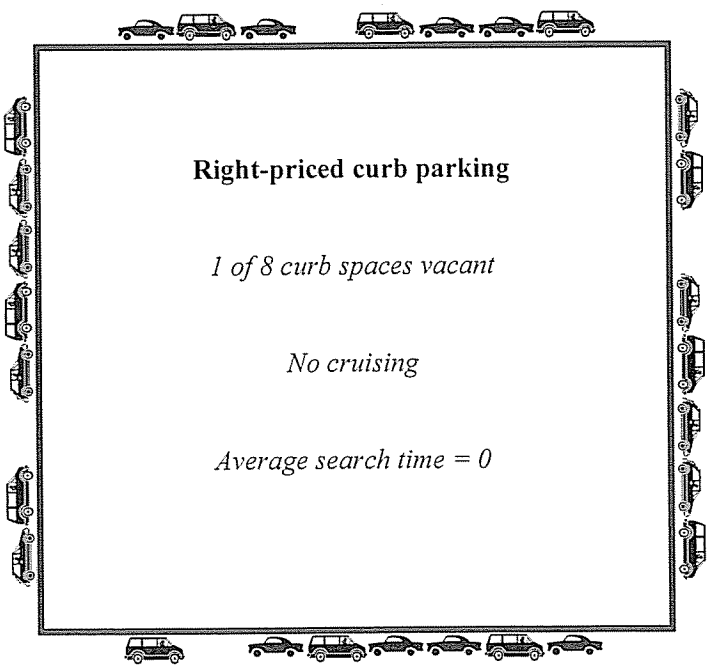

Right-priced curb parking
1 of 8 curb spaces vacant
No cruising
Average search time = 0

Figure 4. Parking prices in midtown Manhattan.

This 20-to-1 price ratio encourages drivers to cruise. In 2006, surveyors interviewed drivers who stopped at a traffic signal on Prince Street in the SoHo district, and 28 percent said they were cruising for parking. Similar results might be found on many other streets in Manhattan. But the high price of off-street parking in midtown Manhattan doesn't mean that the right price for curb parking is also $20 an hour. Private operators can charge a disproportionately high price for short-term parking only because the curb spaces are always full. If the city charges the lowest price for curb parking that will yield a few vacant spaces everywhere, the price of short-term parking off-street will fall to match the curb rate or nobody would park off-street.

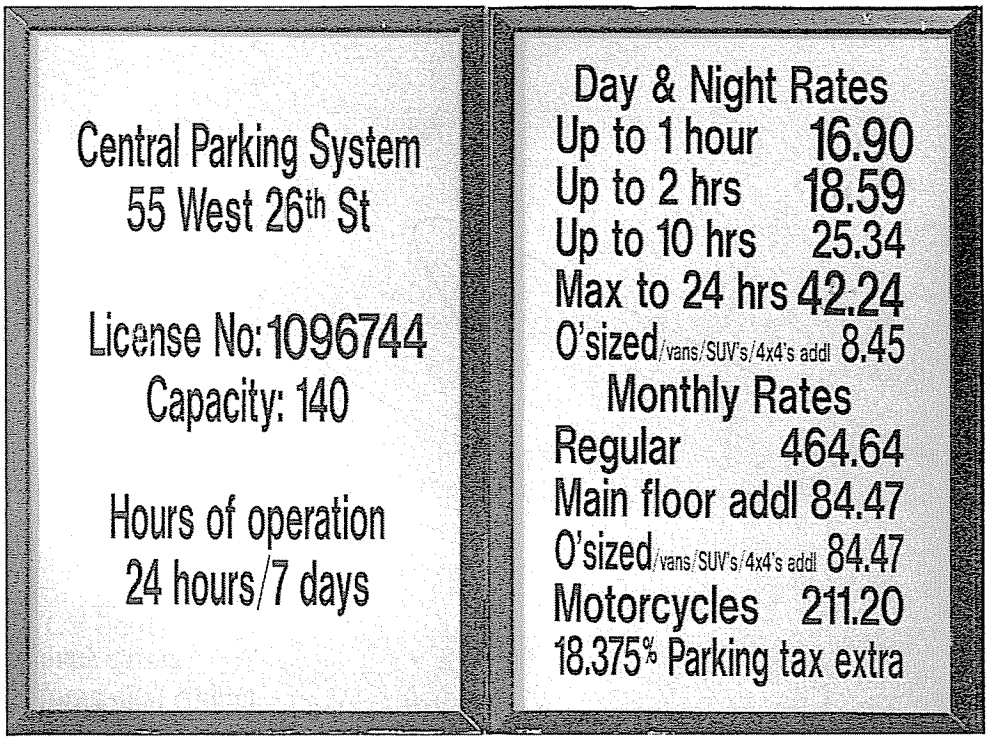
LOCAL PUBLIC REVENUE

Beyond its transportation and environmental benefits, right-priced curb parking can yield ample revenue. If the city returns this revenue to pay for added public services on the metered streets, residents and local merchants will be more likely to support charging the right price for curb parking. The added funds can pay to clean and maintain the sidewalks, plant trees, improve lighting, remove graffiti, bury overhead utility wires, and provide other public improvements.

Put yourself in the shoes of a merchant in an older business district where curb parking is free and customers complain about a parking shortage. Suppose the city installs meters and charges the lowest prices that will produce a few vacancies. Everyone who wants to shop in the district can park quickly, and the meter money pays to clean the sidewalks and provide security. These added public services make the business district a place where people want to be, rather than merely a place where anyone can park free after they cruise long enough to find a space. Returning the meter revenue generated *by* the district *to* the district *for* the district can convince merchants and property owners to support the idea of charging fair market prices for curb parking. No one can say this policy will drive customers away if almost all the curb spaces are always occupied.

When meter revenue goes into the general fund, cities can be careless about collecting it. In downtown San Francisco where the curb spaces are always full, an audit in 2007 found that drivers paid for less than an hour a day per meter. A similar audit in Los Angeles in 2002 found that 96 percent of the vehicles parked at expired meters did not receive citations. If each business district received a share of its meter revenue, citizens would pay closer attention to the receipts.

Some cities have begun to charge performance-based prices for curb parking and return the meter revenue to its source. In Redwood City, California, for example, the city sets meter rates to achieve an 85 percent occupancy rate for curb parking downtown; the rates differ by location and time of day, depending on demand. The city returns the revenue to pay for added public services in the metered district, and downtown Redwood City receives an extra $1 million a year to pay for increased police protection and clean sidewalks. The merchants and property owners all supported the new policy when they learned the meter revenue would pay for added public services in the downtown business district, and the city council adopted it unanimously. Performance-based prices



Off-street: $20

On-street: $1

Figure 4. Price of parking for one hour in midtown Manhattan

create a few curb vacancies so visitors can easily find a space, the added meter revenue pays to improve public services, and these added public services create political support for the performance-based prices.

Redwood City's Parking Ordinance

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.

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.

Revenues generated from on-street and off-street parking within the Downtown Meter Zone boundaries shall be accounted for separately from other City funds and may be used only . . . within or for the benefit of the Downtown Core Meter Zone.

Sections 20.120 and 20.121 of the Redwood City Municipal Code

Most cities keep their meter rates constant throughout the day and let occupancy rates vary in response to demand. Instead, cities can charge different prices at different times of day to keep occupancy at about 85 percent. In Redwood City, the meter rates are higher in the evenings because demand is higher. The meter rates are also higher in the more central spaces. The goal is to balance supply and demand everywhere, all the time.

Most cities also limit the length of stay at meters so long-term parkers won't monopolize the underpriced curb spaces. After Redwood City adjusted meter rates to guarantee the availability of curb spaces, it removed the time limits at meters. This unlimited-time policy has turned out to be popular with drivers who can now park at for as long as they are willing to pay. The demand-determined meter rates create turnover at the convenient curb spaces, and long-term parkers tend to choose the cheaper off-street spaces.

In the past, Cheryl Angeles has had to jump up in the middle of a coloring treatment, foil in her hair and a black-plastic cape around her neck, to pop more quarters in the meter. Twice the self-storage company regional manager got $25 parking tickets when she didn't make it in time. Now that the time limits have been removed, she can pay once and return when the appointment is over.

Wall Street Journal, The Parking Fix

PARKING INCREMENT FINANCE

Most cities now put parking meter revenue into the city's general fund. How can a city return meter revenue to business districts without shortchanging the general fund? The city can keep all the *existing* meter revenue and return a share of the subsequent *increment* in meter revenue—above and beyond the existing meter revenue—that arises from right-priced curb parking. We can call this

arrangement *parking increment finance*. More meters, higher rates, longer hours of operation, and better enforcement will increase the parking revenue in business districts. The added public services paid for by parking revenue will promote business activity, and the increased demand for parking will further increase meter revenue.

GET THE PRICES RIGHT

Where curb parking is underpriced, some drivers cruise for a curb space rather than pay to park off-street, and research throughout the last century has shown that cruising accounts for a substantial share of traffic in city centers. Charging the right price for curb parking can eliminate this unnecessary traffic and all its harmful side effects. Because city governments set the prices for curb parking, they play a large part in determining whether drivers cruise. Cruising for curb parking stems from faulty public prices.

With underpriced curb parking, Westwood Village generates almost a million miles of cruising every year. With right-priced curb parking, downtown Redwood City generates $1 million of meter revenue for added public services. Every city must decide what it wants.

Underpriced curb parking congests traffic, pollutes the air, and wastes fuel. Cities then spend money trying to fix the problems they have created. If cities want to reduce congestion, clean the air, save energy, reduce greenhouse gas emissions, improve neighborhoods, and do all this quickly, they should charge the right price for curb parking and spend the resulting revenue to improve local public services. Getting the price of curb parking right will do a world of good.

Further Reading

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