The Right Price for Curb Parking

April 21, 2016

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If it is feasible to establish a market to implement a policy, no policymaker can afford to do without one. J. H. Dales

The right price for curb parking is the lowest price that can produce one or two vacant parking spaces on each block. The price is too high if many spaces are vacant and too low if no spaces are vacant. But if one or two spaces are vacant on a block, the price is right. Because new arrivals will always see a convenient place to park, everyone will have great parking karma. We can call this the Goldilocks Principle of parking prices. Can anyone propose a better way to set the price for on-street parking?

Prices that produce one or two open curb spaces on every block can improve the city in three ways. First, curb parking will perform better because the spaces will be well used and yet readily available. Second, the transportation system will perform better because cruising for curb parking will not congest traffic, waste fuel, and pollute the air. Third, the economy will perform better because customers will park, buy something, and leave promptly so that new customers can use the spaces.

Primitive technology once made it difficult to charge market prices for curb parking but new technology has solved this problem. Now the real barrier to charging the right price for curb parking is not technology but politics. This paper will explain how to make charging market prices for curb parking politically popular.

The Right Price for Curb Parking in Practice

In 2011, San Francisco adopted the biggest price reform for on-street parking since the invention of the parking meter in 1935. Most cities’ parking meters charge the same price all day and some cities, like Boston, charge the same price everywhere. San Francisco’s meters, however, now vary the price of curb parking by location and time of day.

SFpark, San Francisco’s new pricing program, aims to solve the problems created by charging too much or too little for curb parking. If the price is too high and many curb spaces remain vacant, nearby stores lose customers, employees lose jobs, and governments lose tax revenue. If the price is too low and no curb spaces are vacant, drivers who cruise to find an open space waste time and fuel, congest traffic, and pollute the air.

In seven pilot zones with a total of 7,000 curb parking spaces, San Francisco installed sensors that report the occupancy of each curb space on every block, and parking meters that charge variable prices according to the time of day. In response to the observed occupancy rates, the city adjusts parking prices about every two months, increasing prices if the occupancy is too high and reducing prices if the occupancy is too low.
Consider the resulting prices of curb parking on a weekday at Fisherman’s Wharf, a tourist and retail destination (Figure 1).

Before SFpark began in August 2011, the price was $3 an hour at all times. Now each block has different prices during three periods of the day—before noon, from noon to 3 pm, and after 3 pm. By May 2012, prices on almost every block had decreased for the period before noon.
and increased between noon and 3 pm. Most prices after 3 pm were lower than during mid-day, but higher than in the morning.

SFpark bases these price adjustments purely on observed occupancy. Planners cannot reliably predict the right price for parking on every block at every time of day, but they can use a simple trial-and-error process to adjust prices in response to past occupancy rates. This process of adjusting prices based on occupancy is often called performance pricing. Figure 2 illustrates how nudging prices up on crowded Block A and down on under-occupied Block B can shift a single car to improve the performance of both blocks.

Beyond managing the on-street supply, SFpark helps to depoliticize parking by setting a clear pricing policy. San Francisco charges the lowest prices possible without creating a parking shortage. Transparent, data-based pricing rules can bypass the usual politics of parking. Because demand dictates the prices, politicians cannot simply raise them to gain more revenue.

**Equity in Parking Pricing**

While it is clear that performance parking prices can improve transportation efficiency, are they fair? In San Francisco, 30 percent of households do not own a car, so they don’t pay anything for curb parking. How the city spends its parking revenue also affects the equity. San Francisco uses all its parking meter revenue to subsidize public transit, so automobile owners subsidize transit riders. SFpark will further aid bus riders by reducing traffic caused by drivers cruising for underpriced curb parking.

Performance pricing is not price discrimination because all drivers who park on the same block at the same time pay the same price. Performance pricing is also not the same as maximizing revenue. Because demand was, on average, inelastic, the city could increase revenue by charging
higher prices. However, SFpark’s goal is to optimize occupancy, not to maximize revenue, and the average price of parking fell by 4 percent during SFpark’s first two years.

Parking Benefit Districts

If all the parking meter revenue disappears into a city’s general fund, few businesses or residents will want to charge for on-street parking. But dedicating the meter revenue to pay for added public services in the metered neighborhood can create local support for priced parking. As a way to appeal to local stakeholders, some cities have created Parking Benefit Districts that offer each neighborhood a package including both priced on-street parking and improved public services financed by the parking revenue. Prices manage the parking and the public services improve the neighborhood. Everyone who lives, works, or owns property in the district can then see the benefits paid for by the parking revenue.

Old Pasadena, a historic business district in Pasadena, California, illustrates the potential of Parking Benefit Districts. Old Pasadena improved dramatically after the city used on-street parking revenue of more than $1 million a year to rebuild the sidewalks, plant street trees, add historic street furniture, and increase police patrols. Parking revenue helped to convert a former commercial skid row into a popular destination. Following the example of Pasadena, several other cities, including Austin, Houston, Mexico City, San Diego, and Washington, DC, commit parking revenue to finance public services on the metered streets.

Parking Benefit Districts have been adopted primarily in commercial districts. A big question is whether they can also work in residential neighborhoods where everyone is accustomed to parking free on the street. To answer this question I will focus on neighborhoods where (1) on-street parking is overcrowded, (2) public services are undersupplied, (3) most residents do not own a car, and (4) the residents who do own a car have higher incomes. Parts of many cities fit these four criteria.

Parking Benefit Districts resemble conventional Residential Parking Permit Districts except for two key features: Car owners pay the market price for permits and the parking revenue pays to provide public services on the permit blocks. Conventional residential permits are usually priced far below the market price of parking because car owners have political influence and resist paying the market price to park in front of their own homes. The political incentives change drastically, however, when most residents do not own a car and the parking revenue pays for public services in the neighborhood. The residents’ desire for public services can become a countervailing power against the motorists’ desire to park free.

Most cities issue residential parking permits for all the cars registered at any address. Although cities create permit districts only in neighborhoods where parking is scarce, they can be very freewheeling about the number of permits they issue. For example, a political storm erupted in San Francisco when journalists discovered that romance novelist Danielle Steel had 26 residential parking permits at her house in Pacific Heights.

Charging market prices for the residential permits is the only way to produce significant revenue to pay for public services, and auctioning the permits is the simplest way to establish the market price for on-street parking in a residential neighborhood. A special type of auction, called a uniform-price auction, is often used when a large number of identical items are sold, and some
American universities use uniform-price auctions to sell parking permits. Consider how a uniform-price auction could allocate the permits in a dense residential neighborhood. Suppose each resident on a block that has 40 on-street parking spaces can submit a bid for one permit. The bids are ranked in descending order and the highest 40 bidders receive permits. All the winning bidders then pay the same price: the lowest accepted bid. All but the lowest winning bidder(s) thus pay less than what they actually bid. Uniform-price auctions encourage people to bid the highest price they are willing to pay because the high bidders do not risk paying a price greater than the lowest accepted bid. Bidding the highest price you are willing to pay does, however, ensure that you will receive a permit if your bid is higher than lowest accepted bid.

The auction price for on-street parking is the lowest price possible without creating a shortage of parking and it will presumably relate to the market price of nearby off-street parking. For example, if residents can rent parking in a nearby garage, that price should put a ceiling on what residents are willing to bid for a permit to park on the street. If the monthly rents in the nearest garages are around $100 a month, for example, this seems a reasonable estimate for the auction value of the 40 parking spaces on the street.

Although $100 a month may seem a lot to pay for a permit to park on the street, drivers receive guaranteed parking spaces, which are valuable assets where parking had previously been a big problem. Furthermore, because the parking revenue pays for public services, the combination of guaranteed parking and the new public services may entice even drivers to support priced parking. All the residents who do not own a car will also benefit from the new public services paid for by the priced parking. If most residents do not own a car, they could provide strong political support for Parking Benefit Districts.

If the auction price is $100 a month, the 40 permits will yield total annual revenue of about $48,000 ($1,000 x 40 permits x 12 months) to pay for public services on the block. Each block will require a separate auction because the demand for and supply of on-street parking varies by location. Cities that are not equipped to manage these auctions can contract with e-commerce companies such as eBay that specialize in online auctions. In effect, Parking Benefit Districts can outsource to a market the responsibility to set the right price for parking in residential neighborhoods. And as if in a movie about how great life is in New York, you will always see an open curb space waiting for you at home.

**An Alternative to Alternate-Side-of-the-Street Parking Regulations**

Parking Benefit Districts can also eliminate the requirement for residents to shift their cars from one side of the street to the other on street-cleaning days. As Calvin Trillin showed in his parking novel, *Tepper Isn’t Going Out*, alternate-side parking creates a nightmare for residents who park on the street. If vacuum equipment is used to clean under parked cars, streets can be swept without requiring the cars to move. This vacuuming alternative can end the alternate-side nightmare and eliminate tickets for street-cleaning violations.

Vacuum cleaning a street is more expensive than conventional street sweeping because it requires hiring more personnel and replacing conventional street-sweeping vehicles with different equipment. Parking Benefit Districts can pay this extra cost of cleaning the streets without moving the cars. If ending the requirement to move cars back and forth increases the auction value of
parking permits by more than vacuuming under the parked cars increases the cost of cleaning the streets, there will be even more revenue to pay for other public services.

**Discounts for Shorter and Cleaner Cars**

How many cars can park on a block? That depends on the length of the block and the size of the cars. To encourage drivers to economize on curb space, the city can give discounts on the permit prices for smaller cars that take up less curb space. Because smaller cars tend to be more fuel efficient, discounts for smaller cars will also reduce fuel consumption and CO₂ emissions. Parking discounts based on car size will therefore produce local economic benefits and reduce global environmental costs.

Table 1 illustrates parking discounts based on car lengths. Column 1 shows a selection of cars, and Column 2 shows their lengths, ranging from 20 feet for a Rolls Royce down to 8.8 feet for a Smart car. Column 3 illustrates the discount for each car based on its length. Because the Rolls Royce is 20 feet long, it pays the full price, while the 10-foot Scion receives a 50 percent discount. Two Scions pay the same as one Rolls, so the payment per foot of curb space is the same for both cars. Parking discounts for shorter cars also favor higher fuel efficiency and lower CO₂ emissions. Column 4 shows each car’s fuel efficiency, ranging from 14 miles per gallon for the Rolls up to 37 miles per gallon for the Scion. Finally, Column 5 shows each car’s CO₂ emissions per mile. For example, the Ford emits less than half as much CO₂ as the Rolls. If cities want to reduce CO₂ emissions, they don’t have to wait for state or federal action before offering discounts on permit prices for small cars. Each city can choose its own parking discounts according to its own priorities.

**Table 1. Permit Price Discounts Based on Car Length**

<table>
<thead>
<tr>
<th>MAKE AND MODEL (in 2014)</th>
<th>LENGTH (foot)</th>
<th>DISCOUNT (percent)</th>
<th>FUEL EFFICIENCY (miles/gallon)</th>
<th>CO₂ EMISSIONS (grams/mile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolls Royce Phantom</td>
<td>20.0</td>
<td>0%</td>
<td>14</td>
<td>637</td>
</tr>
<tr>
<td>Lincoln MKS</td>
<td>17.2</td>
<td>14%</td>
<td>22</td>
<td>400</td>
</tr>
<tr>
<td>Buick Regal</td>
<td>15.8</td>
<td>21%</td>
<td>24</td>
<td>371</td>
</tr>
<tr>
<td>Ford Fiesta</td>
<td>14.5</td>
<td>28%</td>
<td>29</td>
<td>301</td>
</tr>
<tr>
<td>Chevrolet Spark</td>
<td>12.1</td>
<td>40%</td>
<td>34</td>
<td>258</td>
</tr>
<tr>
<td>Scion iQ</td>
<td>10.0</td>
<td>50%</td>
<td>37</td>
<td>238</td>
</tr>
<tr>
<td>Smart</td>
<td>8.8</td>
<td>56%</td>
<td>36</td>
<td>243</td>
</tr>
</tbody>
</table>

Will discounts on permit prices for shorter cars be fair? The manufacturer’s suggested retail price starts at $475,000 for a 20-foot Rolls Royce Phantom and at $13,300 for an 8.8-foot Smart car. In this case, it seems unfair not to offer discounts for shorter cars. Most people who can afford to buy a longer car can probably afford to pay more to park it.
Cities with serious air pollution can also give parking discounts for cars with low hydrocarbon or nitrogen oxide emissions. Parking meters in Madrid, for example, charge 20 percent less for clean cars and 20 percent more for dirty cars. According to the head of Madrid’s sustainability division, “We thought it would be fair if the cars that pollute more pay more, and compensate those who use more efficient vehicles.” Prices are the most reliable way for cities to send signals about the behavior they want to encourage, and discounts can easily send these price signals. If cities give discounts on permit prices for smaller and cleaner cars, more people will drive them.

Political Prospects of Parking Benefit Districts

Parking Benefit Districts resemble conventional Permit Parking Districts except for two key features: Car owners who park on the street pay the market price for permits and the parking revenue pays to provide neighborhood public services. Conventional residential permits are usually priced far below the market price of parking because car owners have political influence and resist paying to park in front of their own homes. The political incentives change, however, when most residents do not park on the street and when the parking revenue pays for neighborhood public services. The residents’ desire for public services can become a countervailing power against the motorists’ desire to park free.

To examine the political feasibility of charging for parking to finance public services, we can examine the demographics of people and cars. Take New York City, where 55 percent of households do not own a car, and 78 percent in Manhattan do not own a car. The carless majority will receive better public services without paying anything, and in Manhattan they outnumber the car owners by more than 3-to-1 (Table 2). In some especially dense neighborhoods, the carless residents outnumber car owners by more than 10-to-1. And even among car owners, many park off-street rather than on the street. Where a large majority prefers better public services to free curb parking, a Parking Benefit District may be politically feasible.

<table>
<thead>
<tr>
<th>Table 2. Automobile Ownership in New York City</th>
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<tbody>
<tr>
<td>Number of households</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>Number of households who own cars</td>
</tr>
<tr>
<td>Number of households without cars</td>
</tr>
<tr>
<td>Share of households who own cars</td>
</tr>
<tr>
<td>Share of households without cars</td>
</tr>
</tbody>
</table>

The motoring minority are also richer than the carless majority (Table 3). Households in Manhattan who do own a car have average incomes 88 percent higher than carless households, so charging for parking to pay for public services doesn’t seem unfair.

<table>
<thead>
<tr>
<th>Table 3. Average Annual Income per Household in New York</th>
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<tbody>
<tr>
<td>New York City</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>All households</td>
</tr>
<tr>
<td>Households who own a car</td>
</tr>
<tr>
<td>Households without a car</td>
</tr>
<tr>
<td>Income ratio of owners/nonowners</td>
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</table>
Land, People, and Parking

People economize on land in dense areas by living in smaller apartments in taller buildings. The area of land per person living in a building can therefore be very small. For example, consider a 4,000 square foot lot (40 feet wide and 100 feet deep) that has a 10-story building with 20 apartments (two on each floor). If two people live in each apartment, the building’s footprint is only 100 square feet of land per person (4,000 ÷ 40).

Now consider the on-street parking spaces in front of the building. A 40-foot frontage can accommodate two cars parked on the street. If the curb parking lane is eight feet wide and each parking space is 20 feet long, each car occupies 160 square feet of land. If the on-street parking is free, each resident pays a high price for living on 100 square feet of land while each car pays nothing for parking on 160 square feet of land.

This calculation is only a numerical example, of course, but many cities have high land values, high population density, and free parking on the street. These cities have expensive housing for people and huge subsidies for parking.

Equity in Parking Benefit Districts

If people pay market rates for housing, cars should pay market rates for parking. Nevertheless, some people may think that a lottery giving every car owner an equal chance to win a curb parking space would be fairer than an auction. A lottery, however, would provide no revenue to pay for public services. A lottery would instead give valuable public land to a few lucky car owners and nothing to everyone else. Randomly giving free parking to a few car owners and nothing to many more people who cannot afford a car is hardly fair.

If, for example, charging for parking can earn $50,000 a year to pay for public services on a block, free parking subsidizes car owners by $50,000 a year. Is free parking for a few cars more important than public services for hundreds of people? If the city were already charging market prices for parking and spending $50,000 a year to provide extra public services on a block, few would say the city should remove the public services to provide free parking.

Parking Benefit Districts are bottom-up governance, not top-down regulation. But will charging for parking place an unfair burden on lower-income residents? In Manhattan, car-owning households have almost double the income of carless households. Charging for parking and spending the revenue for public services will therefore transfer income from richer to poorer households. Because relatively rich households who park their private cars on public land will finance public services not only for themselves but also for many relatively poorer people, charging market prices for on-street parking seems fair. When both equity and efficiency are considered, Parking Benefit Districts should be most appropriate where car owners have higher incomes and most residents do not own a car, so the poorer, carless majority will receive public benefits at no personal cost.

Where land is expensive but on-street parking is cheap, cities give big subsidies to a few drivers who park at the curb. Beyond this inequity, drivers waste time and fuel hunting for scarce
curb spaces. This cruising for parking pollutes the air, congests traffic, and endangers pedestrians and cyclists. For example, researchers who interviewed drivers stopped at traffic lights in New York found that 28 percent of the drivers on one street in Manhattan and 45 percent of the drivers on a street in Brooklyn were hunting for curb parking. In another study, observers found that cruising for underpriced parking on 15 blocks in the Upper West Side of Manhattan created about 366,000 excess vehicle miles traveled and 325 tons of CO$_2$ a year. Free curb parking in a congested city gives a small, temporary benefit to a few drivers who happen to be lucky on a particular day but creates large social costs for everyone else every day. Charging fair market prices for on-street parking to create one or two open spaces on every block will end this wasteful cruising.

Charging fair market prices for on-street parking can capture the land value of streets to repair broken sidewalks, plant street trees, install security cameras, or remove the grime from subway stations (Figure 3). In dense neighborhoods, many people will benefit from these public services while few will pay for on-street parking.

![Figure 3. A subway station at West 4th Street in Manhattan](image)

When both equity and efficiency are considered, Parking Benefit Districts should be most appropriate where car owners have higher incomes and most residents do not own a car, so the poorer, carless majority will receive improved public services at no personal cost.

Parking Benefit Districts have the added advantage of providing an entirely new source of public revenue. Financing new public services is often difficult because most existing public revenue has already been spoken for, often in complex ways. Because cities now receive no revenue from curb parking in residential neighborhoods, no new taxes will be required and no other public spending will be reduced when cities charge for residential parking to finance neighborhood public services.

Parking Benefit Districts may be an efficient way to manage on-street parking and a fair way to pay for public services, but do they privatize public land? The government owns the land,
charges market prices for parking on it, and spends the revenue to provide public services. Parking Benefit Districts thus resemble market socialism, not privatization.

**Power Equalization**

Parking Benefit Districts allow each neighborhood to decide whether to charge for curb parking and how to spend the resulting revenue. This pointillist style of public finance can lead to more rational decisions about both parking policies and public services. Land used for on-street parking can become another source of public revenue, without raising taxes. Nevertheless, if richer neighborhoods have a higher demand for curb parking, they will earn more revenue than poorer neighborhoods, which seems unfair. Suppose, for example, Parking Benefit Districts produce an average revenue per curb space of $5,000 a year ($14 a day) in rich neighborhoods and only $500 a year ($1.40 a day) in poor neighborhoods, with a citywide average of $2,000 a year. In this case, rich neighborhoods would receive ten times more than poor neighborhoods. How can a city avoid this inequality and still provide local incentives to charge for curb parking?

One option is to give every Parking Benefit District $1,000 a year per space to pay for added public services, and keep the other $1,000 a year per space for the city’s general fund. In public finance, this type of redistribution is called power equalization. All neighborhoods that charge market prices for their curb parking would receive the same revenue per space. Where the city prohibits curb parking (such as for a bus or bike lane) it could give the districts an equivalent amount of money per foot of curb space.

Power equalization transfers money from rich to poor neighborhoods and yet maintains the incentive for every neighborhood to charge for curb parking. Parking Benefit Districts can equally distribute the value of public land used for private parking, while free parking unequally distributes it as subsidies for car owners. This simple parking reform may be the cheapest, fastest, and easiest way to improve cities and achieve a more just society.

**Conclusion: Turning Problems into Opportunities**

All parking is political, and the prospects for parking reform depend on what the political context allows. Diverse interests from across the political spectrum can for different reasons support a Parking Benefit District. Liberals will see that it increases public spending. Conservatives will see that it relies on markets to allocate scarce land. Drivers will see that it ensures guaranteed curb parking. Residents will see that it pays for public services. Environmentalists will see that it reduces energy consumption, air pollution, and carbon emissions. Business leaders will see that it creates parking opportunities for customers. Libertarians will see that it relies on individual choices. Neighborhood activists will see that it devolves public decisions to the local level. Local elected officials will see that it depoliticizes parking, reduces traffic congestion, and pays for public services without raising taxes.

But all these people also want to park free. They may not have an ideological or professional interest in free parking but they do have a personal interest in it. Nevertheless, strategic use of the parking revenue can create a countervailing personal interest in charging for curb parking. Cities can create the necessary political support for market-priced curb parking by dedicating the resulting revenue to pay for public services on the metered streets.
Streets belong to the community and Parking Benefit Districts can monetize their on-street parking for the benefit of the community. Parking Benefit Districts are most appropriate in dense neighborhoods where (1) on-street parking is crowded, (2) public services are poor, (3) most residents do not own a car, and (4) the residents who do own a car have higher incomes.

Any city can offer a pilot program to charge for on-street parking and use the revenue to finance public services. If residents don’t like the results, the city can cancel the program and little will be lost. If residents do like the results, however, the city can offer this self-financing program in other neighborhoods. Because neighborhoods will have money to spend and decisions to make, residents will gain a new voice in governing their communities. Parking Benefit Districts may turn out to be a fair, efficient, and politically feasible way to improve cities, transportation, the economy, and the environment.
Further Reading


Donald Shoup. 2007 “Cruising for Parking,” ACCESS, No. 30, Spring, pp.16-22.


Donald Shoup, Quan Yuan, and Xin Jiang, “Charging for Parking to Finance Public Services,” forthcoming in Journal of Planning Education and Research.

