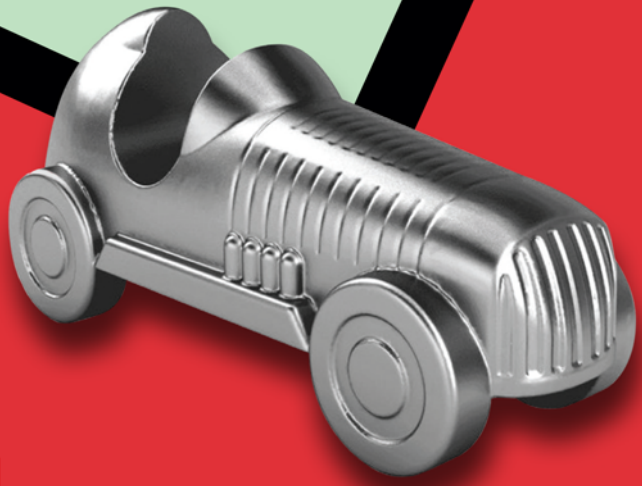
PARKING AND THE CITY



EDITED BY

DONALD SHOUP

A **Planners Press** Book

ROUTLEDGE

Parking and the City

Donald Shoup brilliantly overcame the challenge of writing about parking without being boring in his iconoclastic 800-page book *The High Cost of Free Parking*. Easy to read and often entertaining, the book showed that city parking policies subsidize cars, encourage sprawl, degrade urban design, prohibit walkability, damage the economy, raise housing costs, and penalize people who cannot afford or choose not to own a car. Using careful analysis and creative thinking, Shoup recommended three parking reforms: (1) remove off-street parking requirements, (2) charge the right prices for on-street parking, and (3) spend the meter revenue to improve public services on the metered streets.

Parking and the City reports on the progress that cities have made in adopting these three reforms. The successful outcomes provide convincing evidence that Shoup's policy proposals are not theoretical and idealistic but instead are practical and realistic. The good news about our decades of bad planning for parking is that the damage we have done will be far cheaper to repair than to ignore. The 51 chapters by 46 authors in *Parking and the City* show how reforming our misguided and wrongheaded parking policies can do a world of good.

Donald Shoup, FAICP, is Distinguished Research Professor of Urban Planning in the Luskin School of Public Affairs at the University of California, Los Angeles, USA.

"Don Shoup has done more to revolutionize the way we think about parking than anybody else on the planet. His latest book tells the story of the impact his ideas are having on the subject. It is a must read for anybody who cares about the future of our cities."

Michael Dukakis, Distinguished Professor of Political Science, Northeastern University, USA

Parking and the City

Edited by
Donald Shoup

Routledge
Taylor & Francis Group
NEW YORK AND LONDON

First published 2018
by Routledge
711 Third Avenue, New York, NY 10017

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

Library of Congress Cataloging-in-Publication Data
Names: Shoup, Donald C., editor.
Title: Parking and the city / edited by Donald Shoup.
Description: First edition. | New York, NY : Routledge, 2018.
Identifiers: LCCN 2017057741 | ISBN 9781138497030 (hardback) | ISBN 9781138497122 (pbk.)
Subjects: LCSH: Automobile parking. | City and town life--Parking. | Parking meters.
Classification: LCC HE336.P37 P36 2018 | DDC 388.4/74--dc23
LC record available at https://lccn.loc.gov/2017057741

ISBN: 978-1-138-49703-0 (hbk)
ISBN: 978-1-138-49712-2 (pbk)
ISBN: 978-1-351-01966-8 (ebk)

Typeset in Palatino
by Servis Filmsetting Ltd, Stockport, Cheshire

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Preface to *Parking and the City*

The American Planning Association published *The High Cost of Free Parking* in 2005. Surprising everyone, this 750-page book on parking was popular enough to reprint, with additions, as an 800-page paperback in 2011. Since then, many people have asked for a shorter version of the book to appeal to general readers who are concerned about the future of cities but don't want to buy or read an 800-page book about parking.

The Introduction to *Parking and the City* is this shorter, updated version of *The High Cost of Free Parking.* The following 51 chapters then report on the subsequent flowering of research and action on three recommended parking reforms: (1) remove off-street parking requirements, (2) charge the right prices for on-street parking, and (3) return the revenue to pay for local public services.

Writing about parking without being boring presents quite a challenge. *Parking and the City* is based on my experience as the Editor of *ACCESS,* a magazine that bridges the gap between academic research and practicing planners. Academic research often requires years of work before the author eventually publishes the results. Developing a theory, collecting data, and conducting rigorous statistical tests are necessary before an academic journal will accept an article for publication. Then what happens? A few fellow academics and their students might read the article and discuss it. But city planners and elected officials who can use the results to improve public policy will probably never see the article or even hear about the research.

ACCESS offers academics an opportunity to reach a wider audience. I invite the authors of policy-relevant research on transportation to write condensed versions in plain and even lively English. I have used this same editorial policy for *Parking and the City.* I invited the authors of academic research on parking to write shorter versions for a general audience with high standards for clarity, readability, and even humor. The goal is to take the vital last step in research: make the information accessible. By connecting scholars with practicing planners and elected officials, I hope *Parking and the City* can catapult academic research into public debate and convert knowledge into action. I also have invited local officials who have implemented parking reforms in their cities to write original chapters that explain their methods and the benefits.

I have accumulated many intellectual debts while assembling this book. First, I want to thank my wife Pat, who is the best editor any writer ever had. I also want to thank the many UCLA graduate students who have worked on editing all the chapters. If you find the

book easy to read, you can thank, as I do, Eve Bachrach, Sam Blake, Katherine Bridges, Anne Brown, Kevin Carroll, Jordan Fraade, Cally Hardy, Dylan Jouliot, David Leipziger, Rosemary McCarron, Lance McNiven, Evan Moorman, Taner Osman, Heidi Schultheis, Ryan Sclar, Andrew Stricklin, Jacqueline Su, Ryan Taylor-Gratzer, Trevor Thomas, Zoe Unruh, Julie Wedig, and Warren Wells. Easy reading is hard writing, and I hope these student editors have learned from me as much I have from them. Nancy Voorhees and the Alan and Nathalie Voorhees Fund generously contributed financial support to employ the long parade of brilliant student editors. Krystal LaDuc and Edward Gibbons at Routledge skillfully and patiently converted the manuscript into this book.

Finally, I would especially like to thank the talented, dedicated, and wise James Hecimovich, formerly the editor of the Planning Advisory Service Report series at the American Planning Association. Jim was also the editor of *The High Cost of Free Parking,* and I have greatly enjoyed working with him again.

Both *The High Cost of Free Parking* and *Parking and the City* severely criticize current planning policies. Condemning the way many cities now plan for parking is an indictment of strategy and tactics, not of motives. Whatever our differences, I am sure all planners share the same goal of improving city life. How to go about this task is the enduring question of our profession, and I hope this new book will spur a debate that brings us to a better answer. After all, that is why we are city planners.

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Introduction

He told the truth, mainly.
There was things which he stretched,
but mainly he told the truth.

MARK TWAIN, *HUCKLEBERRY FINN*

At the dawn of the automobile age, suppose Henry Ford and John D. Rockefeller had asked how city planners could increase the demand for cars and gasoline. Consider three options. First, divide the city into separate zones (housing here, jobs there, shopping somewhere else) to create travel between the zones. Second, limit density to spread everything apart and further increase travel. Third, require ample off-street parking everywhere so cars will be the easiest and cheapest way to travel.

U.S. cities have unwisely adopted these three car-friendly policies. Separated land uses, low density, and ample free parking create drivable cities but prevent walkable neighborhoods. Although city planners did not intend to enrich the automobile and oil industries, their plans have shaped our cities to suit our cars. Cars themselves have also reshaped our cities. As John Keats (1958, 13) wrote in *The Insolent Chariots*, "The automobile changed our dress, manners, social customs, vacation habits, the shape of our cities, consumer purchasing patterns, and positions in intercourse." Many of us were probably even conceived in a parked car.

Parking requirements in zoning ordinances are particularly ill advised because they directly subsidize cars. We drive to one place to

do one thing, and then to another place to do another thing, and then finally drive a long way back home, parking free almost everywhere. Off-street parking requirements are a fertility drug for cars.

In *The High Cost of Free Parking,* which the American Planning Association published in 2005, I argued that parking requirements subsidize cars, increase traffic congestion, pollute the air, encourage sprawl, increase housing costs, degrade urban design, prevent walkability, damage the economy, and penalize people who cannot afford a car. Since then, to my knowledge, no member of the planning profession has argued that parking requirements do *not* cause these harmful effects. Instead, a flood of recent research has shown they *do* cause these harmful effects. Parking requirements in zoning ordinances are poisoning our cities with too much parking.

On average, cars are parked 95 percent of their lives and driven only 5 percent (*The High Cost of Free Parking,* Appendix B). As a result, cities require an enormous amount of land for parking. In Los Angeles County, all the parking spaces that cities require cover at least 200 square miles of land, equivalent to 14 percent of the county's incorporated land area and 1.4 times larger than the 140 square miles dedicated to the roadway system (see Chapter 14 below).

Ultimately, parking requirements can make driving more difficult because all the cars engendered by the required parking spaces clog the roads and congest traffic. Los Angeles has more parking spaces per square mile than any other city on earth (*The High Cost of Free Parking,* 161-65), and, according to the INRIX 2016 Global Traffic Scorecard, Los Angeles also has worse traffic congestion than any other city on Earth.

Despite all the harm off-street parking requirements cause, they are almost an established religion in city planning. One should not criticize anyone else's religion, but when it comes to parking requirements I'm a protestant and I believe city planning needs a reformation.

THREE PARKING REFORMS

Reform is difficult because parking requirements don't exist without a reason. If on-street parking is free, removing off-street parking requirements will overcrowd the on-street parking and everyone will complain. Therefore, to distill 800 pages of *The High Cost of Free Parking* into three bullet points, I recommend three parking reforms that can improve cities, the economy, and the environment:

- **Remove off-street parking requirements**. Developers and businesses can then decide how many parking spaces to provide for their customers.

- **Charge the right prices for on-street parking**. The right prices are the lowest prices that will leave one or two open spaces on each block, so there will be no parking shortages. Prices will balance the demand and supply for on-street parking spaces.
- **Spend the parking revenue to improve public services on the metered streets.** If everybody sees their meter money at work, the new public services can make demand-based prices for on-street parking politically popular.

Each of these three policies supports the other two. Spending the meter revenue to improve neighborhood public services can create the necessary political support to charge the right prices for curb parking. If cities charge the right prices for curb parking to produce one or two open spaces on every block, no one can say there is a shortage of on-street parking. If there is no shortage of on-street parking, cities can then remove their off-street parking requirements. Finally, removing off-street parking requirements will increase the demand for on-street parking, which will increase the revenue to pay for public services.

Right pricing is also called demand-based pricing (because the prices are based on parking demand), performance pricing (because the parking performs better), variable or dynamic pricing (because the prices vary), and market-rate pricing (because prices balance the demand and supply for curb parking). I will use these five terms interchangeably.

THE GOALS OF PARKING AND THE CITY

Parking is the Cinderella of transportation. Universities preach equality but they have a rigid internal status hierarchy, including the status of research topics. Global and national affairs have the most prestige, state government is a big step down, and local government seems parochial. Even within the unglamorous world of local government, parking occupies the lowest rung on the status ladder. Because most academics cannot imagine anything less interesting to study than parking, I was a bottom feeder with little competition for many years. But there is a lot of food down there, and many other academics have joined in what is now almost a feeding frenzy. Parking is far too important not to study.

The 51 chapters in this book summarize recent academic research on parking. Several practitioners have also contributed chapters that explain their experience with charging market prices for on-street parking, dedicating the meter revenue to pay for public services, and removing off-street parking requirements. The results show that parking is an important policy issue, not merely a regulatory detail. Parking affects almost everything and almost everything affects parking.

THE MOST EMOTIONAL TOPIC IN TRANSPORTATION

Most people consider parking a personal issue, not a policy question. When it comes to parking, rational people quickly become emotional and staunch conservatives turn into ardent communists. Thinking about parking seems to take place in the reptilian cortex, the most primitive part of the brain responsible for making snap judgments about urgent fight-or-flight issues, such as how to avoid being eaten. The reptilian cortex is said to govern instinctive behavior involved in aggression, territoriality, and ritual display—all important issues in parking.

Parking clouds the minds of reasonable people. Analytic faculties seem to shift to a lower level when one thinks about parking. Some strongly support market prices—except for parking. Some strongly oppose subsidies—except for parking. Some abhor planning regulations—except for parking. Some insist on rigorous data collection and statistical tests—except for parking. This parking exceptionalism has impoverished our thinking about parking policies, and ample free parking is seen as an ideal that planning should produce. If drivers paid the full cost of their parking, it would seem too expensive, so we ask someone else to pay for it. But a city where everyone happily pays for everyone else's free parking is a fool's paradise.

Daniel Kahneman, who won the Nobel Prize in economics in 2002 for his research integrating psychology and economics, summarized some of this research in *Thinking, Fast and Slow*. He examined two modes of thought. Fast thinking is instinctive, emotional, and subconscious, while slow thinking is logical, calculating, and conscious. It's hard to be rational about an emotional subject, but when thinking about parking, we should slow down.

I hope *Parking and the City* will convince readers that parking is worth taking seriously. Few people are interested in parking itself, so I always try to show how parking affects whatever people do care strongly about, such as affordable housing, climate change, economic development, public transportation, traffic congestion, and urban design. For example, parking requirements reduce the supply and increase the price of housing. Parking subsidies lure people into cars from public transportation, bicycles, or their own two feet. Cruising for underpriced curb parking congests traffic, pollutes the air, and creates greenhouse gases. Do people really want free parking more than affordable housing, clean air, walkable neighborhoods, good urban design, and a more sustainable planet? Recognizing that our misguided parking policies block progress toward many goals that people care deeply about—from providing affordable housing to slowing global warming—may spark a planning reformation. Reforms in planning for parking may

be the simplest, cheapest, quickest, and most politically feasible way to achieve many important policy goals.

After this introduction, the following 51 chapters are divided into three parts that correspond to three recommended reforms. Part I focuses on removing off-street parking requirements; Part II focuses on charging the right prices for on-street parking; Part III focuses on spending the resulting revenue to improve public services. In the rest of this introduction I will use material from both *The High Cost of Free Parking* and the chapters in this book to show why these reforms are necessary and how they work.

I. REMOVE OFF-STREET PARKING REQUIREMENTS

City planners set the parking requirements for every art gallery, bowling alley, dance hall, fitness club, hardware store, movie theater, night club, pet store, tavern, and zoo without knowing the demand for parking at any of them. Despite a lack of both theory and data, planners have set parking requirements for hundreds of land uses in thousands of cities—the Ten Thousand Commandments for Off-Street Parking (*The High Cost of Free Parking*, Chapter 3). To paraphrase Charles Darwin, there is grandeur in the array of parking requirements that planners originally created for a few land uses or only one. From so simple a beginning, endless forms of complex parking requirements have been, and are being, evolved.

Although planners have adopted a veneer of professional language to justify the practice, planning for parking is learned on the job and is more a political activity than a professional skill. Consider all the information planners do not know when they set parking requirements:

- How much the required parking spaces cost.
- How much drivers are willing to pay for parking.
- How parking requirements increase the price of everything except parking.
- How parking requirements affect architecture and urban design.
- How parking requirements affect travel choices and traffic congestion.
- How parking requirements affect air and water pollution.
- How parking requirements affect fuel consumption and CO_2 emissions.

Cost is an especially important unknown. For example, without knowing how much the required parking spaces cost to build, planners cannot know how parking requirements increase the cost of housing.

Small, spartan apartments cost less to build than large, luxury apartments, but their parking spaces cost the same. Because many cities require the same number of spaces for all apartments regardless of their size or quality, the required parking disproportionately increases the cost of low-income housing. Minimum parking requirements show that cities care more about free parking than about affordable housing.

Parking requirements reduce the cost of owning a car but raise the cost of everything else. For example, the parking spaces required for shopping centers in Los Angeles increase the cost of building a shopping center by 67 percent if the parking is in an aboveground structure and by 93 percent if the parking is underground (see Chapter 3 below). This increased cost is then passed on to all shoppers. Parking requirements raise the price of food at grocery stores for everyone, regardless of how they travel. People who cannot afford to own a car pay more for their groceries to ensure that richer people can park free when they drive to the store. Parking requirements also help to explain why the rent is "too damn high." Chapter 11 estimates that parking requirements increase the rent carless households pay for their apartments by 13 percent.

Drivers have to pay market prices for their cars, fuel, tires, maintenance, repairs, insurance, and registration fees, but no one argues that all these should be free because charging for them would hurt the poor. People who don't own cars don't pay any of these costs. Nevertheless, cities require people who can't afford a car or choose not to own one to pay for parking.

America is a free country and many people seem to think that means parking should be free. Parking requirements enable everyone to park free at everyone else's expense, and no one knows that anyone is paying anything. Parking is free, however, only because everything else costs more. Parking requirements are well intentioned, but good intentions don't guarantee good results or compensate for unintended harm.

In astronomy, dark energy is a force that permeates space and causes the universe to expand. Similarly, in urban planning, parking requirements are a force that permeates space and causes cities to expand. The higher the parking requirements, the stronger the dark energy that spreads cities out and rips them apart. Parking requirements are an unnecessary evil.

The Pseudoscience of Parking Requirements

When I am invited to a city to speak about parking, I usually start with an aerial view of a site in that city with too much parking, such as this view of an office park in San Jose (Figure I-1). Off-street parking requirements require this pattern of development.

Figure I-1 Office park in San Jose

Too much of suburban America looks like this view of San Jose. We tend to ignore this asphalt blight in our daily life, especially when we park free in it. Parking is only free to us in our role as motorists, however, because we pay for it dearly in every other aspect of our lives. The cost of parking doesn't go away just because the driver doesn't pay for it. In trying to avoid paying for our own parking, we end up paying for everyone else's parking.

I then show a page from San Jose's parking requirements, such as the one in Figure I-2, which shows the city's parking requirements for entertainment and recreation. The many pages of parking requirements illustrate the New Urbanists' complaint that conventional zoning is all about numbers and ratios, with little thought given to how the resulting city will look.

Parking requirements are so precise and so specific for so many land uses that most people probably assume planners carefully study parking. Instead, planners are winging it.

Planners are not oracles who can divine the demand for parking. More often, they act as mediators between opposing political interests. I have never met a city planner who could intelligently explain why any parking requirement should not be higher or lower. The demand for parking is not only more complicated than planners think, but it's also more complicated than planners *can* think (*The High Cost of Free Parking*, Chapters 2 and 3). To set parking requirements, planners usually take instructions from elected officials, copy other cities' parking requirements, or rely on unreliable surveys of the peak parking occupancy

Entertainment and Recreation	
Arcade, amusement	1 per 200 sq. ft of floor area
Batting cages	1 per station, plus 1 per employee
Bowling establishment	7 per lane
Dancehall	1 per 40 sq. ft. open to public
Driving range	1 per tee, plus 1 per employee
Golf course	8 per golf hole, plus 1 per employee
Health club, gymnasium	1 per 80 sq. ft. recreational space
Miniature golf	1.25 per tee, plus 1 per employee
Performing arts production per rehearsal space	1 per 150 sq. ft. of floor area
Poolroom	1 per 200 sq. ft. of floor area
Private club of lodge	1 per 4 fixed seats on the premises, or 1 per 6 linear feet of seating, plus 1 per 200 square feet of area without seating but designed for meeting or assembly by guests, plus 1 per 500 sq. ft. of outdoor area developed for recreational purposes
Recreation, commercial (indoor)	1 per 80 sq. ft. of recreational area
Recreation, commercial (outdoor)	20 per acre of site
Skating rink	1 per 50 sq. ft. of floor area
Swim and tennis club	1 per 500 sq. ft. of recreation area

Figure I-2 Parking requirements in San Jose, California

observed at a few suburban sites with ample free parking and no public transit. Parking requirements are closer to sorcery than to science.

Because cars must park somewhere, many people think parking behaves like a liquid. If the parking supply is squeezed in one place, cars will park somewhere else. But parking behaves more like a gas; the number of cars expands and contracts to fill the available space. More parking leads to more cars. Nevertheless, planners base parking requirements on the assumption that cars and people come in fixed proportions, and they often state the requirements in parking spaces per person: per beautician, dentist, mechanic, nun, student, teacher, or tennis player. This assumed ratio between cars and people is in turn based on the assumption that all parking is free. If parking were priced to cover its cost, the ratio of cars to people would be lower.

Next, I show the size of the parking lots resulting from San Jose's parking requirements for a few land uses. When you take into account the individual spaces and add the access aisles to that calculation, each

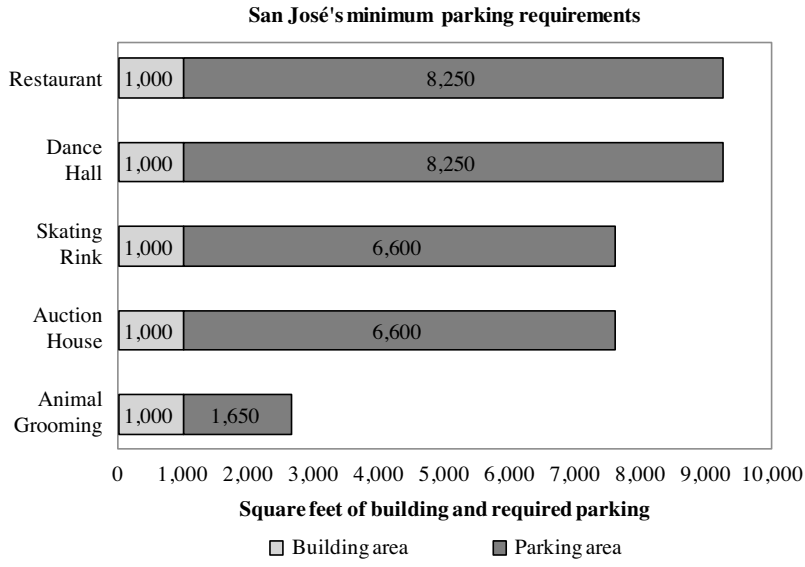

Figure I-3 Size of buildings and the required parking in San Jose, California

parking space typically requires about 330 square feet of land. For many land uses, the parking lots are bigger than the buildings they serve (Figure I-3). There is more space for parking than for people.

The light gray bar on the left represents 1,000 square feet of the building, and the darker gray bar on the right shows the size of the required parking lot. For example, San Jose requires 25 parking spaces per 1,000 square feet of dining area in a restaurant, and 25 parking spaces occupy 8,250 (25 × 330) square feet. The parking lot for a restaurant is thus more than eight times the size of the restaurant itself. Parking requirements provide parking everywhere anyone wants to go, but they also create many places where few people want to be. Furthermore, some of this expensive parking is rarely used. Underused parking has even inspired an annual photo contest showing half-empty parking lots at shopping centers on the day after Thanksgiving, one of the busiest shopping days of the year (Schmitt 2014).

Parking requirements make the city friendly to cars but not to people—drivable but not walkable. As Jane Jacobs (1962, 19) wrote, "The more downtown is broken up and interspersed with parking lots and garages, the duller and deader it becomes, and there is nothing more repellent than a dead downtown." We want more out of our streets than just traffic and free parking. We also want prosperity, safety, health, walkability, and pleasure.

If citizens demand off-street parking requirements, however, I think the right ones are the lowest ones that are politically possible after planners have made a strong case for low or no parking requirements. Planners can suggest many ways to reduce parking requirements. For example, developers can include bicycle parking spaces and on-site parking spaces for shared cars, offer cash-out programs for commuter parking, and offer free transit passes to all residents of an apartment building (see Chapters 19, 20, and 43, and *The High Cost of Free Parking*, Chapter 10). These programs can justify targeted reductions in parking requirements even where political concerns do not allow removing them.

The High Cost of Parking Requirements

Parking requirements resemble what engineers call a *kludge*—an awkward but temporarily effective solution to a problem, with many moving parts that are clumsy, inefficient, redundant, hard to understand, and expensive to maintain. Microsoft users will easily understand this concept. Planners should recognize that off-street parking requirements are a kludge designed to prevent a shortage of free on-street parking. Parking requirements are superficially plausible but fundamentally wrong. To paraphrase Anthony Downs (2004), using parking requirements rather than prices to balance the supply and demand for parking is like adjusting the position of a picture on the wall by rebuilding the wall rather than by shifting the picture.

Parking requirements are like barnacles on a ship, accumulating one at a time and slowing the ship's progress. These requirements have severed the link between the cost of providing parking and the price that drivers pay for it. They increase the demand for cars, and when citizens object to the resulting traffic congestion, cities respond by restricting development to reduce traffic. In sum, cities require parking and then limit the density of people to limit the density of cars. Free parking has become the arbiter of urban form, and cars have replaced people as zoning's real density concern.

In disputes about exactly how many parking spaces a city should require for every land use, each side makes solemn claims backed by dubious evidence. Parking requirements may look scientific, but compared with the current science behind parking requirements, Scientology is science and the Wizard of Oz was a scientist. Parking requirements are a step up from astrology, but they are several steps short of the Farmers' Almanac. They give pseudoscience a bad name.

Planners often use "motivated reasoning" to justify the parking requirements required by elected officials who want enough parking to

ensure they won't be yelled at about parking shortages. Planners must create arguments for conclusions already reached. Assumptions are the starting point of most parking requirements, and the person who makes the assumptions determines the outcome. Instead of reasoning about parking requirements, planners are forced to rationalize them and must feign expertise they don't have. Setting the parking requirement for any land use is like searching in a dark room for a black cat that isn't there and claiming that you have found it.

Planners typically assume that all residents come with a car and require enough off-street parking to house the cars. Most residents usually do come with a car, but that is only because requiring plenty of off-street parking ensures that most residents will own a car. Parking requirements thus result from a self-fulfilling prophecy that everyone needs parking. Everyone needs parking because parking requirements engender an oversupply of cars that are then used to justify the need for parking requirements.

Urban planners cannot say how many parking spaces every apartment building needs any more than they can say how many cars every family needs. Because the number of available parking spaces affects the number of cars a family will own, the number of cars a family owns cannot predict the number of parking spaces that planners should require. The supply of parking creates its own demand, and planners estimate the demand for free parking as the way to require supply. It's as if planners required storage space in every residence based on their estimate of all the stuff they think people will store in the required space. Requiring every building to provide ample parking encourages everyone to buy a car.

All the required parking takes up a lot of space. Each off-street parking space typically occupies about 330 square feet (half for the parked car, and half for the access aisles). Because there are at least three off-street parking spaces per car in the United States (Chapter 8), and three parking spaces occupy about 990 square feet (330 × 3), there are at least 990 square feet of off-street parking space per car. In comparison, there are about 800 square feet of housing space per person in the United States (Moura, Smith, and Belzer 2015, 11). The area of parking per car in the United States is thus larger than the area of housing per human. Most of this parking is free to motorists because its cost is bundled into higher prices for housing and everything else.

Parking requirements result from complex political and economic forces beyond the control of city planners, such as demands for high parking requirements from residents who oppose nearby development. Nevertheless, planners enable the pseudoscience of parking requirements and the public bears the cost. When it comes to parking requirements, planners have used Pandora's box as a toolkit.

Evidence from In-Lieu Fees

Off-street parking requirements are counterproductive because cities can't fix traffic congestion and air pollution by subsidizing cars. We can use cities' in-lieu parking fees to suggest the subsidy for cars. Some cities allow developers to pay a fee in lieu of providing the off-street spaces required for a new building; the cities then use the revenue to provide public parking spaces (*The High Cost of Free Parking*, Chapter 9). The willingness to pay in-lieu fees rather than provide parking spaces shows that a developer wants to provide less parking.

To justify their in-lieu fees, some cities calculate the cost per parking space added by new public garages (*The High Cost of Free Parking*, Chapter 6). For example, in 2016 Palo Alto, California, calculated that its public parking garages cost $67,429 for every parking space added. Palo Alto therefore charges developers $67,429 for every required private parking space not provided.

This in-lieu fee reveals the cost of parking requirements. Palo Alto requires four parking spaces per 1,000 square feet for commercial uses. Because the in-lieu fee is $67,429 per space, the in-lieu fee is $269,716 (4 × $67,429) per 1,000 square feet of commercial area. The in-lieu fee thus adds almost $270 ($269,716 ÷ 1,000) per square foot to the cost of a new building that doesn't provide parking. This added cost is like an impact fee to pay for parking (impact fees on new development pay for the costs of providing public services to the new development). The in-lieu fee hides the cost of parking by bundling it in the cost of development. In-lieu fees unveil the high, hidden cost of parking requirements.

Palo Alto also levies impact fees on new buildings to pay for parks, libraries, and public safety facilities: $5.04 per square foot of building area for parks, $0.27 per square foot for libraries, and $0.58 per square foot for public safety facilities (City of Palo Alto 2016). Palo Alto's in-lieu parking fee of $270 per square foot thus dwarfs the impact fees that it imposes for all other public purposes combined. If impact fees reveal a city's priorities among public services, Palo Alto's highest priority is free parking.

America's Report Card

Every four years, the American Society of Civil Engineers issues its Report Card for America's Infrastructure showing the condition of 16 infrastructure categories. Figure I-4 shows the Report Card for 2017. The grade point average was D+.

If the civil engineers included parking in their Report Card, it would probably earn an A+. The Good Intentions Paving Company

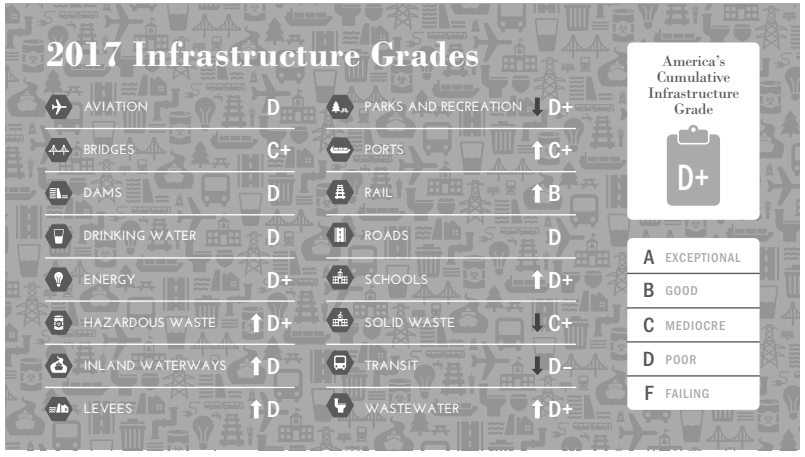

Figure I-4 American Society of Civil Engineers Report Card for America's Infrastructure

has produced great parking, and off-street parking requirements have hidden its cost in higher prices for everything else.

Although public infrastructure is an essential input for all economic activity, the U.S. probably spends more to subsidize parking than for all the rest of its transportation infrastructure combined. The estimated total subsidy for off-street parking in the U.S. in 2002 was between $127 billion and $374 billion (*The High Cost of Free Parking*, 205–208). In comparison, the total public infrastructure spending (capital, operation, and maintenance) for transportation by federal, state, and local governments in 2002 was $190 billion (Congressional Budget Office, 2015). Therefore, the total subsidy for off-street parking was somewhere between 67 percent and 197 percent of total public infrastructure spending for highways, mass transit, rail, aviation, and watertransportation in the U.S. Users pay for much of the public spending for highways, mass transit, rail, aviation, and water transportation through gasoline taxes and other fees, but parking fees paid by drivers pay for less than 4 percent of the cost of parking (*The High Cost of Free Parking*, 208–210).

The Unequal Burden of Parking Requirements

Cities require parking for every building without considering how the required spaces place a heavy burden on poor people. A single parking space, however, can cost more than the net worth of many U.S. households. Table 3-1 shows an estimate that the average construction cost (excluding land cost) for parking structures in 12 U.S. cities in 2012

was $24,000 per space for aboveground parking and $34,000 per space for underground parking.

By comparison, in the U.S. in 2011, the median net worth (the value of assets minus debts) was $7,700 for Hispanic households and $6,300 for Black households (see Figure 4-1). One space in a parking structure therefore costs at least three times the net worth of more than half of all Hispanic and Black households in the country. Because cities require parking spaces at home, work, stores, restaurants, churches, schools, and everywhere else, there are several required parking spaces for every household, and the costs are passed on to all consumers.

Off-street parking requirements have produced an environment where most people feel they need a car to get a job, go to school, and shop. In a misguided attempt to provide free parking for everyone, cities force poor people to pay for parking spaces they can ill afford and often don't use. Free parking has the veneer of equality, but it increases inequality. It is wasteful *and* unfair.

Cities have a limited amount of money to spend on helping poor residents, and subsidizing parking is not the best way to spend this money. Free parking has two grave flaws as a way to aid poor people. First, free parking will not aid the poorest residents who cannot afford to own a car. Second, free parking will mainly aid the richer residents who own most of the cars. Nevertheless, cities seem willing to pay any price, bear any burden, and meet any hardship to ensure the survival and success of free parking. Cities have expensive housing for people but at least three parking spaces for every car (see Chapters 6, 13, and 14).

Parking requirements may seem fair, but they produce unfair results. To assess the financial reserves available to households, in 2015 the Federal Reserve Board (2016, 22) conducted a survey asking respondents how they would pay for a $400 emergency expense. Forty-six percent said that they would have to cover the expense by selling something, or borrowing the money, or would not be able to come up with the $400 at all. Although almost half of all families live from hand to mouth, parking requirements compel every household to pay for several off-street parking spaces even if they don't own a car.

City planners cannot do much to counter the inequality of wealth in the U.S., but they can help to reform their cities' off-street parking requirements that unfairly place heavy burdens on the poor (see Chapter 4). The planning profession should issue a recall for parking requirements.

Every Sin Is Forgiven If It Is Done with Our Permission

Removing off-street parking requirements has yet another advantage: It reduces the opportunities for corruption. When cities require off-street

parking, they can issue planning variances that grant exceptions from parking requirements; that is, the city can allow a business to provide fewer than the required number of parking spaces because of a special circumstance, which is sometimes a donation to influence a bureaucrat or politician. When cities establish parking requirements, city officials have something to sell—a reduction in the parking requirement.

Just as the medieval Catholic Church sold indulgences for the remission of sins, cities can sell planning variances. In Dostoyevsky's *The Brothers Karamazov*, the Grand Inquisitor of Seville explained why the Church was popular even though it threatened Hell as the punishment for minor sins: "Every sin will be forgiven if it is done with our permission." Similarly, if cities require off-street parking, officials can forgive the sin of providing fewer than the required number of parking spaces.

Seeking a parking variance from city hall resembles buying an indulgence from the medieval church. Money goes in; favors come out. Removing the parking requirements will remove the temptation for elected officials to sell variances that allow sinfully few parking spaces.

Beyond saving money, removing the parking requirements will reduce the risk of development. Requiring developers to *ask* for a parking variance increases the risk of their projects because everyone has the legal right to oppose the variance and extract concessions, even when parking is not the opposition's real concern. Opposition to a parking variance makes it appear that everyone wants–demands–more parking when parking is only a pretext and what the opponents really want is to stop development. If a city allows development without parking, the objections to granting a parking variance will vanish and developers can propose financially viable projects.

Maximum Parking Limits

We often recognize the fine line between sensible planning and a foolish blunder only after we have crossed it. In the future, I think planners will look back at our predatory parking requirements the way we now look back at the urban renewal programs of the 1960s—they seemed like a good idea at the time but they created a disaster.

Some prescient critics foresaw the grave consequences of parking requirements. In 1927, Hawley Simpson, who was a founding member and then president of the Institute of Transportation Engineers, predicted that requiring off-street parking would create many problems (*The High Cost of Free Parking*, 279–80). He wrote, "Rather than assisting in solving the street traffic problem, it may very probably have the opposite effect by inducing a large amount of unnecessary vehicle usage. Free storage is an economic fallacy." Lewis Mumford (1963, 23)

warned, "The right to have access to every building in the city by private motorcar, in an age when everyone possesses such a vehicle, is actually the right to destroy the city." Unfortunately, city planners ignored these warnings. Parking requirements were not just a misguided step onto the slippery slope toward command-and-control planning. Many cities have landed in the ditch at the bottom of the hill.

In the aftermath of urban renewal programs and minimum parking requirements, some U.S. cities' downtowns began to resemble images of medieval Romans camping in the ruins of an ancient and superior civilization. Fortunately, many cities have reversed course. San Francisco now has maximum parking limits with no minimum requirements in its downtown, while Los Angeles has minimum parking requirements with no maximum limits. Someone has to be wrong.

Maximum parking limits are justified if the traffic is so congested and the air is so polluted that a neighborhood can't safely handle any more cars. But a problem with maximum parking requirements is how to set them. The simplest reform of U.S. zoning would be to declare that all the existing off-street parking requirements are maximums rather than minimums, without changing any of the numbers. If minimum requirements specify what a city considers enough parking spaces, what is the harm in prohibiting more than enough parking spaces?

The successful experience of cities that do have maximum parking limits in their Central Business Districts (such as Boston, Chicago, New York, and San Francisco) is clear evidence that bankers will lend and developers will build in areas with parking maximums. The CBDs in these cities have much more development than the CBDs in cities that still have minimum parking requirements, such as Detroit and Phoenix. One banker told me he was willing to lend for a building with limited parking if it is in a district where all the other buildings also have limited parking. Maximum parking limits mean that bankers and developers have a city-imposed disarmament treaty in their competition to woo tenants with free parking.

Removing minimum parking requirements is much easier than reducing them or imposing maximum parking limits because planners don't have to invent the lower minimums or new maximums, justify them, and then administer them. In many cities, removing minimum parking requirements will also probably be much more important and much less controversial than imposing maximum parking limits. Zhan Guo studied what happened when London replaced parking minimums with maximums in 2004 (see Chapter 16). Before the change most developments provided no more parking than the minimum required, whereas after the change most developments provided much less than the maximum allowed. After the change, the parking supply in new buildings was only 68 percent of the new maximum allowed and only

52 percent of the previous minimum required. The new maximum limits caused only 2 percent of the decline in the parking supply; almost all the benefits of shifting from minimum requirements to maximum limits resulted simply from removing the minimum requirements.

Pretextual Parking Requirements

Some planners say that minimum parking requirements are needed because they enable cities to reduce the parking requirements in exchange for community benefits, such as affordable housing. For example, California requires cities to reduce the parking requirements for residential developments that include a specific share of affordable housing units (see Chapter 17). Reducing parking requirements as an inducement to provide affordable housing shows how unnecessary the parking requirements are in the first place. Cities would never reduce the code requirements for safe electrical wiring or fire escapes in exchange for affordable housing units in a development, but parking can easily be bargained away because it is obviously not necessary.

Reducing the parking requirements for developments that include affordable housing, however, has led affordable housing advocates in California to oppose any general reduction in parking requirements, even if this would increase the supply of housing and therefore make all housing more affordable. Affordable housing advocates would lose a bargaining chip they now use to secure a few dedicated affordable units in new developments. In this case, parking requirements are used as a *pretext*; their stated goal is to increase the parking supply but the real goal is to place a heavy burden on developers that the city can reduce in exchange for whatever it really wants (Manville and Osman 2017). This pretext is largely futile because developers usually provide the required parking and the city ends up with expensive housing and too much parking.

How can cities remove their minimum parking requirements and still have the bargaining power that the parking requirements provide? They can establish maximum parking limits and allow developers to provide more spaces if they pay a fee for every space they provide above the limit (*The High Cost of Free Parking*, Chapter 9). Mexico City adopted a version of this policy when it changed from minimum parking requirements to maximum parking limits in 2017 (see Chapter 15). Mexico City charges developers a fee for every space provided above half the maximum number allowed. I do not recommend establishing pretextual parking maximums to use as a bargaining tool with developers. Nevertheless, if cities want to use parking as a bargaining tool, it is much better to bargain from the starting point of low maximum limits than of high minimum requirements.

The Upside of Minimum Parking Requirements

If cities tried to micromanage other parts of our lives the way they micromanage off-street parking, everyone would join the Tea Party. Nevertheless, the upside is that removing the parking requirements can do so much good. Figure I-1 showed the asphalt desert created by excessive parking in Silicon Valley. Many spaces around the periphery of the parking lots remain vacant all the time. What would happen if San Jose removed off-street parking requirements, charged demand-based prices for on-street parking, and used the resulting revenue to improve neighborhood public services? Property owners might decide their land is more valuable for housing than for parking. If a city wants more housing and less traffic, removing off-street parking requirements will help.

Everyone in Silicon Valley complains about expensive housing, long commutes, traffic jams, polluted air, and the difficulty of attracting employees. Figure I-5 suggests what could happen to the scene in Figure I-1 if San Jose removed its off-street parking requirements. Housing could be built on the periphery of parking lots. A large parking lot can easily be redeveloped because it has a single owner, has no demolition costs, does not require new infrastructure, and is near both jobs and shopping. If apartment buildings were built on the parking lots next to the sidewalks, anyone walking, biking, or driving by would see a real city. The smartest way to travel is to be near your destination already, and this job-adjacent housing would give commuters out-of-car experiences while walking to work.

Figure I-5 An office parking lot lined with apartment buildings

The housing can be built without new parking because the existing spaces can be shared between office buildings and apartments. To avoid a parking shortage, the cost of parking will have to be separated from the rent for apartments and offices, so only drivers will pay for parking (*The High Cost of Free Parking*, Chapter 20). Residents who work in a nearby office building may find they can live with only one or even no car. They will have the option to rent an apartment without paying for two parking spaces, an option that parking requirements now prohibit. The new housing can't cause gentrification or displacement because no one lives on the parking lots now. The acres of surface parking offer the possibility of something much better, but parking requirements make the vision in Figure I-5 impossible. If cities remove the parking requirements at office parks, shopping malls, and big box stores, the peripheries of their parking lots can become sites for infill development.

Converting parking spaces into housing sites can reduce traffic congestion because more people could walk, bike, or ride transit to their destinations. Some of the remaining automobile travel could be in shared cars or through Lyft and Uber. The asphalt landscape in too much of America is not walkable, beautiful, or sustainable, but it can be reformed and transformed. Removing parking requirements can produce a cascade of benefits: shorter commutes, less traffic, a healthier economy, a cleaner environment, and more affordable housing. And the benefits don't stop there. If we reform our misguided planning for parking, and therefore our overreliance on the personal car, vast parking lots can evolve into real communities. Economic objectives are often said to conflict with environmental objectives, but parking reforms can easily serve both objectives at once. Parking reforms that make sense on economic grounds also make sense on environmental grounds.

The money now spent on cars and fuel can be spent on other things. Cars and fuel are often imported, but we cannot import apartment buildings. Spending less for cars, fuel, and parking, and spending more for housing will increase the demand for labor in a host of professions, such as architects, carpenters, electricians, engineers, gardeners, glaziers, lawyers, locksmiths, painters, plumbers, real estate agents, roofers, surveyors, and even urban planners. Parking lots employ few people but building on parking lots will boost the whole economy.

Parking requirements make U.S. cities look different from the European cities that many Americans admire. Most U.S. cities put a floor under the number of parking spaces to satisfy the peak demand for free parking, and then put a ceiling on development density to limit vehicle trips. Many European cities do the exact opposite; they put a ceiling on the number of parking spaces to avoid traffic congestion and put a floor under allowed development density to encourage walking, cycling, and public transport. In sum, many European cities limit

parking and require density, whereas most U.S. cities limit density and require parking. U.S. buildings are now connected more closely to their parking than to the cities around them. Unfortunately, city planners have ignored the Hippocratic oath "First, do not harm" as a guiding principle in planning for parking.

Many successful business districts were built before cities began to require every business to have its own off-street parking. In cities that do require off-street parking, some business districts succeed if the city uses in-lieu fees to finance public parking structures so that businesses do not have to provide their own on-site parking (*The High Cost of Free Parking*, Chapter 10). Developers pay a fee for every required parking space they do not provide. Beverly Hills, Old Pasadena, and the Third Street Promenade in Santa Monica (all in California) are good examples. Try to think of any successful shopping street where every store has its own on-site parking.

Off-street parking requirements without the option to pay in-lieu fees leave no way to develop a successful group of stores except as a shopping mall. No one can build a street of shops of the sort that was common before cities began to require each building to provide its own parking. Only inside the better malls can most Americans find the dense, pedestrian-friendly shops that off-street parking requirements have made impossible everywhere else. Off-street parking requirements promote malls and devitalize cities. Parking requirements favor cars, and removing those requirements will level the playing field.

Some critics argue that removing an off-street parking requirement amounts to "social engineering" and a "war on cars." Instead, parking requirements are the social engineering and a war on walking. All the required parking spreads buildings apart so people need cars to get around. Removing a requirement that restaurants must provide 10 parking spaces per thousand square feet of floor area, for example, is no more a war on cars than removing a requirement that everyone must eat 10 hamburgers a month would be a war on hamburgers. Removing a parking requirement does *not* interfere in the market, and it is *not* a war on cars.

When it comes to off-street parking, I'm pro-choice. Cities should not require developers to give birth to unwanted parking spaces. Parking requirements were a bad idea, poorly executed, and it is easy to see the disastrous results—asphalt everywhere and a lack of life on the streets. It is hard to see the good results that parking requirements prevent but Figure I-5 shows how cities might look without parking requirements. The upside of the mess we have made is that we have an accidental land reserve available for job-adjacent housing. If cities remove their unwise parking requirements, we can reclaim land on a scale that will rival the Netherlands.

Parking requirements are a top-down decision by city planners and elected officials to replace many independent decisions by residents, developers, lenders, buyers, and travelers. Zoning now forces cities to gorge on parking. Stopping this force feeding is not the same thing as putting the city on a parking diet.

Even President Obama weighed in against off-street parking requirements because they "impose an undue burden on housing development.… These requirements have a disproportionate impact on housing for low-income households because these families tend to own fewer vehicles but are nonetheless burdened by the extra cost of parking's inclusion in the development" (The White House 2016, 16). And as Joseph Stiglitz, who won the Nobel Prize in Economics in 2001, has argued, reforms in land and housing are the key to a fairer economy. Because parking requirements commit so much land to cars and raise the cost of housing so much for people, reforms in parking requirements may be the most politically feasible way to reduce inequality (*The High Cost of Free Parking*, Chapter 19).

Cities have three good reasons to remove minimum parking requirements: We can't afford them, we don't need them, and they do immense harm. Wishing that parking requirements did not exist, however, is not a strategy for removing them. Parking requirements respond to a real problem but they are the wrong solution, and cities cannot remove their parking requirements without also better managing on-street parking. Cities require off-street parking so they won't have to manage on-street parking. The chapters in Part II focus on charging the right prices for on-street parking to prevent congestion at the curb without requiring off-street parking.

II. CHARGE THE RIGHT PRICES FOR ON-STREET PARKING

Many people think that parking is like sex—if you have to pay for it, it's just not right. It's also easy to think that parking is like oxygen, so essential that it's a human right and should be free for everyone. Free parking almost *is* a human right in the U.S. because drivers park free at the end of 99 percent of their trips (*The High Cost of Free Parking*, Appendix B). But even if parking is necessary, it doesn't have to be free. Food and housing are also necessary, but we don't assume they should be free.

Charging too much or too little for on-street parking can cause a lot of harm. If the price is too high and many curb spaces are vacant, adjacent businesses will lose customers, employees will lose jobs, and cities will lose tax revenue. If the price is too low and no curb spaces are vacant, drivers searching for a place to park will congest traffic, waste fuel, and

pollute the air. Consequently, the right price for curb parking is the *lowest* price that can keep a few spaces open to allow convenient access. This is the Goldilocks principle of parking prices—not too high, not too low, but just right.

With conventional parking meters, the price stays the same throughout the day but the occupancy rate varies. With dynamic parking meters, the prices vary but the occupancy rate stays the same—one or two spaces are open. Goldilocks prices will give all drivers great parking karma and will guarantee front-door access to all businesses.

The curb lane may be much more productive in uses other than parking. For example, in dense neighborhoods a bike station can serve many more people than the same length of curb used for parking. In a study comparing a bike station on one side of a street with three curb parking spaces occupying the same length of curb on the other side of the street in Manhattan, Metcalf (2017) reported that during an hour almost 200 people arrived or departed from the bike station while only 11 people arrived or departed from the three parking spaces.

Wherever the curb is used for parking, it is important to price the parking properly to make sure it is being used properly. Market prices for curb parking will then help cities compare the value of parking spaces with the value of wider sidewalks, bike stations, or loading zones, and better judge the highest and best use of their valuable real estate.

The High Cost of Free Curb Parking

Underpriced curb parking creates an incentive to cruise in already-congested traffic. Cruising creates a moving queue of cars that are waiting for curb vacancies, but no one can see how many cars are in the queue because the cruisers are mixed with other cars that are actually going somewhere. Nevertheless, a few researchers have attempted to estimate the share of traffic that is cruising and the time it takes to find a curb space. They have analyzed videotapes of traffic flows, interviewed drivers who park at the curb or are stopped at traffic lights, and have themselves cruised for parking.

Table 25-1 shows the results of 22 studies of cruising for parking. Between 8 and 74 percent of the traffic was cruising, and the average time to find a curb space ranged between 3.5 and 14 minutes. These results are selective because researchers study cruising only where they expect to find it: on downtown streets where traffic is congested and all the curb spaces are occupied. On streets where open curb spaces are readily available, no one needs to cruise for parking. Because curb parking is underpriced and overcrowded in the busiest parts of most of the world's big cities, however, the sun never sets on cruising.

Newspapers often report on cruising. For example, consider this report in the *Los Angeles Times* (October 13, 2014): "In Los Angeles, parking your car on the street can be almost as stressful as driving it in traffic. Day after day, motorists repeat the same drill in the congested neighborhoods of the city: They weave up and down the streets, eyes peeled for an empty spot or a driver sitting in a parked car. (Is he maneuvering out or angling his way in?) Then they circle the block again and maybe again, getting sadder and madder with each loop." Drivers may begin to think the only way to find a parking space is to buy a parked car.

On-street parking is the most contested public land outside the Gaza Strip, and the competition for space can be fierce. In one study, the German Automobile Club set up video cameras at each intersection in central Freiburg and used them to follow randomly selected cars traveling from one intersection to another. The researchers estimated that 74 percent of the 800 cars followed on camera were cruising for parking and would have parked immediately had they found a space. The cameras revealed another notable finding: cruising, the researchers reported, produces psychological changes as drivers creep along in search of a parking space:

> This fixation on a parking space turns many drivers into unscrupulous maniacs. When all else fails, they will pull into any available space in a no-stopping zone, on the sidewalk, or even in an intersection (*The High Cost of Free Parking*, Chapter 11).

Closer to home, consider parking at a local farmers market. Drivers aggressively compete for the nearby on-street parking. But in the farmers market itself, everyone is considerate, trying not to get in each other's way, waiting patiently when someone else is blocking them, and saying "after you" when two people get to the counter at the same time. People's personalities don't change in the few minutes it takes to walk from their cars to the market. Instead, what changes is the transition from competing for parking in an overcrowded commons to cooperating in a market where everyone pays for what they buy.

Having an open parking space available on the street is like having an open pump space available at a gas station. When the government capped gas prices at the pump in 1979, long lines immediately formed at gas stations. Drivers had to wait for their turn to fill up. The lines of idling cars spilling onto the streets showed the mistake of setting below-market prices for gasoline, and the price caps were removed in 1981. When cities charge below-market prices for curb parking, drivers have to cruise in search of an open space but we can't see the lines of cars waiting for parking. We know some cars are cruising because we have done it ourselves.

Suppose we had two kinds of gas stations, private and public. The private stations sell gas at market prices, but the public stations sell gas at heavily subsidized prices. The market-priced private stations won't have any lines at the pump, but the underpriced public stations will have long lines at the pump, with engines idling, drivers fuming, and time being wasted, as with underpriced curb parking.

For each hour that an additional car is parked on a crowded street, other drivers will have more difficulty finding an open space and will spend more time cruising for parking. Inci, Ommeren, and Kobus (2017) estimate that for each extra hour that a car parks at a crowded curb, the total extra time that other drivers waste while cruising for parking is worth about 15 percent of what an average worker earns in an hour. This external cost is only for the additional time spent by drivers who are cruising, and cruising does far more than waste the cruisers' time. Cruising also congests traffic, pollutes the air, endangers pedestrians and cyclists, and creates CO_2 emissions. All these extra costs show that underpriced parking costs a lot more than right-priced parking.

The U.S. spends about as much to subsidize the parking-industrial complex as on Medicare, and the parking subsidies encourage additional driving (*The High Cost of Free Parking*, Chapter 7). To fuel this extra driving, the U.S. imports oil and pays for it with borrowed money. Just as we now look back at gas price controls in 1979–1981 as a well-intended disaster, we will eventually look back at underpriced curb parking as a far greater man-made disaster that has lasted far longer.

Some critics may say that using market-clearing prices to allocate curb parking amounts to rationing. We already ration parking now, but we don't do it rationally. Drivers who cruise for free curb parking pay with time rather than money. Their cruising congests traffic, pollutes the air, and wastes energy. If drivers pay for curb parking with money, that money can then pay to clean the sidewalks and repair streets. Cities that underprice their curb parking are telling drivers to foul the environment and starve public services.

The Cumulative Costs of Cruising

The driver who occupies the last open parking space on a street creates a cascade of costs for everyone else because cruising for parking is nonlinear. There is no problem finding a curb space if one space is open on a block. When that last space is filled, however, there is no place to park, and new arrivals have to circle the block in their air-conditioned or heated cocoons with seats as soft as a caramel mousse. The cruising cars increase the traffic flow as they troll for open spaces. So filling the last curb space on a block quickly creates a problem.

Traffic congestion is also nonlinear. If the traffic flow increases past a critical point where cars are bunched too close together, suddenly all the cars and buses are mired in stop-and-go traffic. The cars' fuel consumption in traffic is also nonlinear. When traffic becomes stop-and-go, the cars' fuel consumption, pollution emissions, and greenhouse gas emissions per mile quickly increase. And drivers who are distracted while hunting for parking increase the accident risks for pedestrians, cyclists, and other drivers. So the car that fills the last open curb space on a block creates a domino effect of damaging consequences. The maddening shortage of on-street parking also leads to political demands for off-street parking requirements that have further consequences throughout the housing and transportation markets. Cruising for free curb parking is individually rational but collectively insane.

Filling the last open parking space on a block has consequences similar to those in the proverb about the lack of a single horseshoe nail:

> For want of a nail the shoe was lost.
> For want of a shoe the horse was lost.
> For want of a horse the rider was lost.
> For want of a rider the message was lost.
> For want of a message the battle was lost.
> For failure in battle the kingdom was lost.
> And all for the want of a horseshoe nail.

The lack of an open parking space may seem as minor as the lack of a horseshoe nail, but the unfolding chain of consequences is similarly disastrous. Failing to charge the right prices for curb parking can lead to widening dysfunctions in related markets and produce grave results that few people will trace back to the lack of an open curb space. By the same reasoning, charging the right prices can produce a cascade of benefits that few people will trace back to an open parking space. An open parking space helps everyone, not just drivers. And there is yet another benefit. Every year, Americans waste 3.14159 billion hours complaining about parking, and getting the prices for parking right will save all this lost time.

Now, the mark of a great city is that there are never enough places to park. With demand-based prices for curb parking, great cities will have enough places to park and more money to pay for public services. A few vacant spaces on a crowded street may look underused or even wasted, but the vacant spaces are valuable *because* they are vacant.

Debating the Doubters

Despite all the damage done by cruising, convincing cities to charge market prices for curb parking is hard. I know because I have tried

for many years in many cities to make the case for market-priced curb parking. Drivers who want to park for free tend to shout and they dominate most public debates.

In 2009 I was invited to make a presentation in Santa Rosa, in the wine country of Northern California. Santa Rosa has a lively downtown with many good restaurants and a parking problem. I was pleased to see the large auditorium in city hall packed to hear a professor talk about parking. I spoke for an hour and explained why I thought Santa Rosa should charge market prices for its scarce curb parking and spend the revenue to improve the metered areas.

I pointed out that the city's parking meters operated from 8 a.m. to 6 p.m., but almost all the curb spaces were empty before 10 a.m. and full after 6 p.m. I suggested that the city should begin to operate the meters at 10 a.m. so more customers might come to the coffee shops that were open early and instead operate the meters longer in the evening to prevent a shortage of curb spaces for diners. If the meters create a few open spaces in the evening, people will find it easier to drive to the many restaurants. Anyone who doesn't want to pay for curb parking can park free in Santa Rosa's municipal garages. If the meters are priced right, cars will fill most of the curb spaces, leaving only one or two vacant spaces on each block. If the curb spaces are almost but not quite full all the time, parking meters can't be chasing many customers away.

The audience seemed to agree, but the first question came from an angry man in the top row of seats. He wasn't foaming but people nearby seemed to recoil from bits of saliva. He shouted that if the city ran the parking meters in the evening, he would never come to a restaurant downtown again. He seemed to think that settled the question.

Elected officials and city planners can't argue in a public meeting with an angry citizen about parking because his anger might be the tip of an iceberg of popular opposition. But I responded that if this guy didn't drive downtown, someone who was willing to pay for parking would take his place. And I asked, who do you think will leave a bigger tip in a restaurant? Someone who will come downtown only if he can park free after driving for 20 minutes hoping to see a car pulling out, or people who are willing to pay for parking if they can easily find a curb space near the restaurant? I also suggested that if he didn't want to pay for parking downtown, he might get a better deal in the food court of a suburban mall with ample free parking. The audience began to cheer and clap, no longer the silent majority.

I had dined in restaurants in Santa Rosa the previous two evenings, and I asked the waiters—as I do whenever I visit a restaurant—where they park. If the restaurant is in a part of town with parking meters that stop operating at 6 p.m., the waiters almost always say that they try to arrive before 6 p.m. when there are a few metered spaces available,

pay for the short time until 6 p.m., and then they can park free for the rest of the evening. That seems good for the waiters, but they occupy parking spaces that customers could have used. That means fewer customers for the restaurants and also fewer tips for the waiters.

Waiters who park at the curb will probably be solo drivers, but two, three, or four diners may arrive in one car. If a metered curb space turns over twice during the evening, each space can deliver two groups of diners to a restaurant rather than one waiter. With more customers, the restaurants can expand and hire more waiters. It seems counterintuitive that waiters will be better off if the parking meters operate in the evenings, but waiters and everyone else involved will benefit. Some waiters can move to garages or more distant on-street parking, and restaurant customers will take their place. The on-street parking will be well used but the parkers will be different—they will be customers, not waiters. Business will improve even if the parking occupancy doesn't look much different.

One argument against operating meters in the evening is that the conventional one- or two-hour time limits are inconvenient for customers who want to spend more time at a restaurant or theatre. For this reason, cities should remove the time limits at meters in the evening and allow prices alone to create turnover.

A stronger argument against operating meters in the evening is that waiters and other service staff who work late hours and earn low wages cannot afford to pay for parking. For this reason, some cities offer free or discounted parking passes in municipal garages for evening and night workers rather than keep the on-street parking free. Because nights are usually a time of low demand in downtown garages, there are plenty of off-street parking spaces available. When Santa Fe, New Mexico, extended its meter hours into the evening, it also began to offer "social equity" parking passes in municipal garages at half the usual price for drivers who work for downtown business and have wages of $15 an hour or less. Portland, Oregon, and Sacramento, California, have similar programs. Shifting workers to off-street spaces can make the most convenient on-street spaces available for customers.

Finally, to shorten any debate about how much to charge for on-street parking, I sometimes ask critics of demand-based prices what principle they would use to set the prices for parking on every block at every time of day. Asserting that demand-based prices are unfair is much easier than coming up with a logical alternative.

It took longer than I expected for Santa Rosa to adopt any of the parking reforms I had proposed. In 2017 Santa Rosa decided to operate the parking meters from 10 a.m. to 8 p.m. and to increase the meter prices in the high-demand areas to $1.50 an hour. As reported in the city's newspaper, *The Press Democrat*,

> The city has been considering progressive parking policies since 2009, when Donald Shupe, an influential academic on the subject, visited Santa Rosa and outlined his views. He is the author of a book called "There Ain't No Such Thing as Free Parking." Shupe argued that a community should shoot for 85 percent occupancy of its parking spaces, and adjust rates to hit that level if possible (McCallum 2017).

The author misspelled my name and garbled the book's title, but he nailed the policy proposal: "a community should shoot for 85 percent occupancy of its parking spaces and adjust rates to hit that level if possible."

Perishable Goods

Although perishable may seem a strange word to describe parking, a parking space is what economists call a perishable good. A perishable good has fixed costs and cannot be stored. Airline seats and hotel rooms are examples of perishable goods—an empty seat on an airplane or an empty hotel room cannot be stored and sold later. Therefore, like effective management for airlines and hotels, effective management for parking requires ensuring that the spaces are used efficiently.

Private operators adjust prices of perishable goods to maximize revenue, but a city's goal for curb parking should be different. Full occupancy of curb parking produces unwanted cruising, while low occupancy means the curb spaces are not delivering customers to the adjacent businesses. A city must balance the competing goals of reliable availability (one or two spaces are open on each block) and high occupancy (most of the spaces are occupied by customers). If parking demand varies greatly over time, pricing curb parking to balance supply and demand creates a conflict between the two goals of ready availability and high occupancy. The key measure in setting prices should focus on the arriving drivers' ability to find an open space.

When Seattle began to base parking prices on demand, the city council directed the Seattle Department of Transportation (SDOT) to "set rates to achieve approximately one or two open spaces per block face throughout the day. The policy objective is to ensure that visitors to neighborhood business districts can find a parking spot near their destination. SDOT may both *raise* and *lower* rates in different areas as appropriate to meet the occupancy target" (City of Seattle 2011). After the first occupancy counts in the city's 22 meter districts in 2011, SDOT increased meter rates in four districts, left them unchanged in seven, and reduced them in eleven.

Business groups supported the city council because the city switched from a revenue goal to an outcome goal for setting meter rates. The

city continues to earn revenue but revenue is no longer a justification for raising meter rates. The goal of one or two open spaces per block is an easy way to explain that the purpose is to guarantee parking availability and reduce cruising. Because some blocks are short and have few spaces, while others are long and have many spaces, the goal of one or two vacant spaces on every block cannot be applied rigidly.

Given the random nature of arrivals and departures, cities will need to accept some time during which a street has two or more vacancies so there will be less time with no vacancies. Instead of aiming for an average occupancy, a city can aim to keep at least one vacant spot on every block for at least a certain share of every hour. A city will have three goals in setting a target occupancy rate for curb parking:

1. ***Ready availability.*** Availability can be defined as the share of an hour (e.g., 50 minutes) with at least one vacant space on the block. Ready availability means that drivers can usually find a convenient open space.
2. ***High occupancy.*** Occupancy can be defined as the average share of spaces that are occupied during the hour. High occupancy means that the curb spaces are well used and serve many customers.
3. ***Revenue.*** Revenue depends on both the meter price and the occupancy rate. Revenue should not be the primary goal, but there will be revenue if the program is managed well.

Cities face a trade-off between ready availability and high occupancy. These two goals conflict because raising the meter rates to ensure at least one vacant space will reduce the average occupancy rate. Suppose, for example, a city sets prices to ensure a vacant space on each block for at least 50 minutes during each hour. If at least one vacant space is available on that block for only 30 minutes in an hour, the availability target is not met, and the price should increase. This price increase, however, means that the average occupancy during the hour will decline.

San Francisco and Los Angeles are the first two cities to set parking prices by time of day and location, and they adjust these prices every two or three months in response to the observed occupancy, although by different rules. During each time period on each block, San Francisco sets the prices to achieve an average target occupancy rate on each block, while Los Angeles sets the prices to achieve a target share of the time with at least one open space on each block.

San Francisco

In 2011, San Francisco adopted SF*park*, a pricing program that aims to solve the problems created by charging too much or too little for curb parking. In seven pilot zones across the city, with a total of 7,000 curb spaces, San Francisco installed sensors that report the occupancy of curb spaces on every block and parking meters that charge variable prices according to location and time of day. The meters were also the first in San Francisco to accept payment by credit cards, and this convenience provided good publicity for SF*park*.

SF*park* adjusts parking prices every six weeks in response to the average parking occupancy during the previous six weeks. If the occupancy rate on a block was higher than 80 percent during a time period (such as from noon to 3 pm), the hourly price of parking increases by 25 cents. If the occupancy rate was below 60 percent, the hourly price of parking decreases by 25 cents. Consider the resulting prices of curb parking on a weekday at Fisherman's Wharf, a popular tourist and retail destination, after almost two years of price adjustments (see Figure 37-1).

Before SF*park* began in August 2011, the price for a space was $3 an hour at all times. With SF*park*, each block can have different prices during three periods of the day—before noon, from noon to 3 pm, and after 3 pm. By May 2012, most prices had decreased in the morning hours. Some prices increased between noon and 3 pm—the busiest time of day—and most prices declined after 3 pm. Prices changed every six weeks, never by more than 25 cents per hour.

SF*park* based these price adjustments purely on observed occupancy. City 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. The only way to tell whether the price is right is to look at the results. The right price for curb parking is the price that leads to the right occupancy rate, and it is like the Supreme Court's definition of pornography: "I know it when I see it." I won't know the right price for curb parking until I see the right occupancy.

Did these small changes in parking prices change many drivers' behavior? Only a few drivers have to change their behavior to produce the right parking occupancy because most drivers are not trying to park, and many drivers who do want to park will park off street. Of those few drivers who want to park at the curb, even fewer will have to change their behavior to create one vacant space on each block. Therefore, SF*park* does not have to change many drivers' behavior to improve parking availability and reduce traffic congestion. If only a few drivers change their behavior, finding a curb parking space will no longer resemble winning the lottery.

Where the meters are priced correctly, drivers will not need information about parking availability on every block because an open space will be available almost everywhere. Drivers will only need information about parking prices to choose the best place to park.

Demand-based parking prices are efficient, but are they fair? Thirty percent of households in San Francisco don't own a car, so they don't pay anything for curb parking. San Francisco uses all its parking meter revenue to subsidize public transit, which helps everyone who can't afford a car. SF*park* further aids bus riders, cyclists, and pedestrians by reducing the traffic caused by cruising for underpriced and overcrowded curb parking. So it's hard to argue that SF*park* is unfair.

If the price of parking is the same everywhere, no one can save money by parking in a cheaper space and walking farther. Suppose you want to park on a street at Fisherman's Wharf, where prices shifted from $3 an hour all day to different prices on different blocks at different times of day, ranging from 25 cents an hour on many blocks to a maximum of $3.75 an hour on one block (see Figure 37-1). Would you rather face the previous price of $3 an hour on every block, or the prices after 10 adjustments in the first two years of SF*park*? If you walk a few blocks you can pay only 25 cents an hour. That seems like a big improvement for low-income drivers. People can now walk to save money on curb parking.

Suppose you are not short of money and you want to park in front of the address you are visiting. Would you prefer to pay $3 an hour for a parking spot after cruising several blocks to find it, or would you prefer the SF*park* prices that ensure a vacancy on every block? SF*park* can help everyone, rich or poor.

SF*park* also helps to depoliticize parking because transparent, data-based pricing rules can bypass the usual politics of parking. Demand dictates prices and politicians cannot simply raise prices to gain revenue. SF*park*'s goal is to optimize occupancy, not to maximize revenue, and prices can go down as well as up. Because most prices had been too high in the mornings, the average price of curb parking fell by 4 percent during SF*park*'s first two years.

Before SF*park* began, skeptics worried that variable parking rates would create uncertainty and confuse customers. SF*park* changed more than 5,000 prices at the 7,000 SF*park* meters in the first year, but there were no complaints about uncertainty. If inching prices up or down every six weeks really did confuse drivers, one would expect someone to complain. Available parking is more important than fixed prices.

Because parking is more readily available, San Francisco issues fewer tickets for illegal parking in the SF*park* zones. Variable prices,

more availability, and fewer tickets are far more customer-friendly than fixed prices, parking shortages, and more tickets. SF*park* could also encourage merchants to post the maps of parking prices in their stores as a way to improve the drivers' knowledge about prices and show them how to take advantage of the price differences to save money.

In preparing for SF*park*, San Francisco conducted a census of its parking spaces and found 275,450 on-street spaces (San Francisco Municipal Transportation Agency 2014). If laid end-to-end, San Francisco's on-street parking would stretch about 1,000 miles, which is longer than California's 840-mile coastline. San Francisco has one on-street parking space for every three people in the city, but only 10 percent are metered. Expanding SF*park* into more areas that have a shortage of curb parking can better manage this valuable public space and also yield revenue for public services. In January 2018, San Francisco expanded SF*park* to include all of the city's 28,000 metered parking spaces and to all city-owned garages and lots.

SF*park* will always be a work in progress because the right price for curb parking is always a moving target and the parking technology is improving rapidly. Chapters 36–40 analyze the results of SF*park*.

Los Angeles

In 2012, Los Angeles launched LA Express Park (see Chapter 41), which resembles SF*park* except for one key difference. In Los Angeles, the price adjustments are based not on average occupancy during a time period, but rather on parking availability, measured by the share of each hour in which a block is overused (over 90 percent occupancy), underused (below 70 percent occupancy), or well used (between 70 and 90 percent occupancy).

Los Angeles contracts with the Xerox Research Centre in Grenoble, France, to analyze the parking occupancy data and recommend the price changes. If the block is overused a large fraction of the time and underused a small fraction of the time, the price increases. If the block is underused a large fraction of the time and overused a small fraction of the time, the price decreases. If the occupancy is neither overused nor underused most of the time, the price does not change.

A difficult decision arises, however, when there are spikes in demand at some times but demand is low most of the time. Xerox devised an algorithm that compares the fractions of time that are overcrowded, underused, or just right to recommend price changes (Zoeter et al. 2014). One way to deal with the problem of both congestion and underuse of

parking during the same time period is to divide the day into shorter time periods that will allow more price changes in response to the varying demand.

LA Express Park has aroused almost no political opposition. Most drivers don't even seem to notice that prices are changing. LA Express Park began with 6,300 meters downtown, and the city has extended the program to Hollywood, Westwood Village, and Venice.

The technology used for demand-based pricing in Los Angeles and San Francisco is getting both cheaper and more sophisticated. Other cities will therefore find it easier to mount similar programs. Baltimore, Berkeley, and Oakland have begun to charge demand-based parking prices with simple technology (see Chapter 35). Boston and Washington, D. C., have also begun to charge demand-based parking prices with more advanced technology.

The results in Los Angeles and San Francisco show that cities can make huge improvements even without frequently adjusting prices in response to demand. Simply extending the operating hours for existing meters into the evening in places with high demand rather than turning the meters off at 6 p.m. is a demand-based strategy, and it does not require any new investment. The meters are already there, so they will reduce parking and traffic congestion and bring in new revenue without any new cost.

People who beg for a living work until midnight in many cities but the parking meters quit work at 6 p.m. Why not run the meters during the times of high parking demand in the evening and use some of the money to help the homeless? Similarly, cities can operate their meters during times of high demand on Sundays. If cities carry the argument for demand-based pricing to its logical conclusion, they can extend the hours of meter operation for as long as needed to manage demand, and thus provide large benefits where meters already exist. If cities put their meters to sleep at 6 p.m. and on Sunday, they have learned little about demand-based prices for curb parking.

After several years of experience, cities may be able to shift from reaction to prediction when adjusting prices, such as with seasonal adjustments. Like hockey players who skate to where the puck will be, cities can base parking prices on expected future demand, not simply on past occupancy. Parking prices will never be a simple joystick that planners can use to manipulate precise outcomes because it's almost impossible to get the price of parking exactly right all the time. Nevertheless, cities can do a far better job than they do now to balance supply and demand. When parking is overcrowded, it is underpriced, not undersupplied.

Equity

A final question about demand-based prices for curb parking is whether they will penalize the poor. Although the lion's share of parking subsidies go to people who are not poor, drivers who don't want to pay for parking often push poor people out in front of them like human shields, claiming that charging market prices for curb parking will hurt the poor. This objection is either misguided altruism or disguised self-interest.

Are flexible parking prices really unfair to poor people? Let's look at the bigger picture. The prices for fresh fruits and vegetables vary to balance supply and demand according the season. The prices for hotel rooms vary to balance supply and demand according to location and time of year. The prices for theater seats vary to balance supply and demand by location and day of the week. The price of gasoline varies from place to place and from day to day. Are all these and many other price variations unfair to poor people? If not, why would parking prices that vary to balance supply and demand be unfair to poor people? And how much money are we really talking about here? It's only curb parking. Drivers should expect to pay for parking if they take two tons of metal with them wherever they go.

Admittedly, some drivers do prefer to spend their time circling the block, congesting traffic, wasting energy, polluting the air, slowing public transit, endangering pedestrians and bicyclists, causing accidents, and contributing to climate change rather than pay to park. But faster and cheaper public transit, cleaner air, and safer walking and biking will help everyone who is too poor to afford a car. The public services financed with parking revenue will also help the poor. On balance, right-priced curb parking can help the poor and everyone else.

Disabled Placard Abuse

California may have been the wrong place to test demand-based prices for curb parking because the state requires all cities to allow cars with disabled placards to park free at meters, with no time limit. The placards are thus permits to park free at any meter for an unlimited time. Because controls on obtaining or using a disabled placard are lax, 9 percent of registered drivers in California now have a disabled permit, and evidence of placard abuse is everywhere. Because of the widespread abuse, disabled placards do not guarantee a physical disability. Instead, they often signal a desire to park free and a willingness to cheat the system. Placard abusers learn to live without their scruples but not without their cars.

Because many people with disabilities are too poor to own a car, the all-placards-park-free policy delivers an unnecessary benefit to placard abusers and to people with disabilities who are not poor. Far worse, the all-placards-park-free policy has created a culture of corruption. More of the subsidy for placards probably goes to morally handicapped placard abusers than to low-income drivers with serious physical disabilities. The rampant abuse encouraged by free parking for all placards has made life even harder for everyone with impaired mobility.

If disabled placard abuse is common on a block that is fully occupied, raising the price will not affect placard abusers, but it will reduce the number of paying parkers at the curb and make even more spaces available to placard abusers. Therefore, revenue will decline but availability will not increase. Placard abuse throws sand in the gears of LA Express Park and SF*park* and helps to explain why they were much less effective in reducing occupancy on congested blocks than in increasing occupancy on underused blocks. Increasing the price of curb parking drives away paying parkers and allows placard abusers to take their place. Disabled placard abuse is the Achilles heel of demand-based parking pricing.

Michigan and Illinois have adopted a two-tier system that takes into account different levels of disability. Drivers with disabilities that seriously limit mobility can park free at meters, and drivers with less serious disabilities must pay. Enforcement is simple: drivers without serious mobility impairment who use the special serious-disability placard to park free at meters are obviously breaking the law as soon as they step out of a car and stride away. Other states require all placard holders to pay at meters. Demand-based prices for curb parking will produce far greater benefits in states that do not invite placard abuse by treating placards as permits to park free at any meter for an unlimited time. Chapters 30–32 analyze the problems caused by meter exemptions for placards and propose ways to solve the problem.

Progressive Parking Prices and Fines

Demand-based parking prices can create curb vacancies but cities may also want to ensure steady turnover. To encourage turnover, a city can charge progressively higher parking prices for successive hours. Table 28-1 shows the progressive rate structure in Albany, New York. The hourly price for the first two hours is $1.25, and the price of each subsequent hour increases by 25 cents, with no time limit.

Some cities charge progressive prices on game days near stadiums that generate periodic peak demands. Brookline, Massachusetts,

charges special prices at meters on Beacon Street close to Fenway Park: $1 an hour for the first two hours and $10 an hour for the third and fourth hours, with a maximum of $22 for the day. Washington, D.C., has similar progressive parking rates around the Nationals baseball stadium. Washington also dedicates the extra revenue from the game days to pay for added public services in the area, such as cleaning and repairing the sidewalks. If cities charge progressive parking prices on game days and spend the revenue on public services, stadiums can help rather than harm the surrounding neighborhoods.

Progressive parking prices are appropriate where a city wants to encourage turnover, but they are not appropriate at times when the demand for parking is declining. For example, if the demand for parking is declining during the evening, higher prices per hour for longer parking durations will be counterproductive. The price may have to decline over time to keep the spaces occupied during the time of lower demand.

Some cities have also adopted progressive parking fines to deter repeat violators who often account for a large share of all violations (Chapter 29). In Los Angeles, for example, 8 percent of the license plates that received tickets in 2009 accounted for 29 percent of all the tickets in that year. Most drivers rarely or never receive a parking ticket, and for these drivers modest fines are a sufficient deterrent. But the many tickets for a few repeat offenders suggest that modest fines will not deter drivers who view parking violations as an acceptable gamble or just another cost of doing business. If cities raise parking fines high enough to deter the few chronic violators, they unfairly penalize many more drivers for occasional, often inadvertent violations.

Progressive parking fines deter repeat violators without unfairly punishing anyone else. Progressive fines are lenient for the many cars with one or two tickets a year but punitive for the few cars with many tickets. In Claremont, California, for example, the first ticket for overtime parking in a calendar year is $35, the second $70, and the third $105. For illegally using a disabled parking space, the first ticket is $325, the second $650, and the third $975.

Progressive parking prices encourage turnover without overcharging the short-term parkers, and progressive parking fines encourage compliance without penalizing the occasional offenders. Recent advances in parking technology now make it possible for any city to use these progressive parking prices and fines.

Sophisticated Parking Technology

Parking was for many years the most stagnant industry outside North Korea. Now, however, nothing in parking is the last word for long. The

parking industry is taking advantage of everything Silicon Valley has to offer, and the humble parking meter has improved rapidly in recent years. Meters now accept payment by credit cards and cell phones. They can charge different prices by time of day or day of the week, depending on demand. Parking officials can remotely reconfigure the price schedule in any neighborhood, and the new rates are sent wirelessly to all the meters in the neighborhood. They can be multilingual and guide the users through transactions, displaying messages such as "Please insert your card other side up."

Parking occupancy sensors have also evolved rapidly. The first generation of sensors used in San Francisco and Los Angeles were embedded in the pavement and had to be dug up or abandoned when the batteries needed replacement, but new forms of occupancy sensing have developed. Some single-space meters have occupancy sensors embedded in the meter heads, which lower the power requirements and simplify the battery replacement. Parking enforcement vehicles equipped with cameras to record license plate numbers can also count the number of parked cars. Fixed-mount cameras can also analyze parking occupancy.

The technology of metering and occupancy sensing is becoming cheaper and better so fast that programs like SF*park* and LA Express Park will be much easier for other cities to adopt. We may soon consider coin-in-the-slot parking meters as primitive as the Wright brothers' first airplane at Kitty Hawk.

Two new technologies—occupancy sensors and variably priced parking meters—may change parking and transportation as profoundly as the invention of the cash register in the nineteenth century changed retail commerce. They can unlock the immense value of land now devoted to free parking and bring transportation into the market economy. The adage that "You can't manage what you can't measure" fits parking perfectly. Setting the right price for on-street parking is much cheaper than requiring developers to supply ample off-street parking. Only on-street parking management can solve on-street parking problems.

Performance pricing requires surprisingly little information. Planners compare the actual parking occupancy with the desired occupancy and nudge prices up or down accordingly. Because free parking is the perfect medium for political pandering, politicians are not the right people to set parking prices. An impersonal rule to seek the optimal occupancy becomes the new apolitical way to set prices. Cities can depoliticize parking by combining new technology with the old law of supply and demand.

Performance pricing for curb parking is not a simple plug-and-play operation, but most cities will soon have the technical capacity to charge prices that ensure one or two open curb spaces most of the

time on every block. The new parking technology makes smart parking policies possible, and the new smart policies increase the demand for the new technology. Intelligent transportation technology is the key to intelligent parking management.

Technology will continue to change the way we park. Finding and paying for parking is migrating to the internet and the dashboards of connected cars. Just as drivers now expect their navigation systems to choose the best routes for trips, they may soon expect these systems to give them turn-by-turn directions to the closest and cheapest parking available at their destinations, and to pay for parking automatically with bits rather than quarters. Before cars learn to drive themselves, they should be able to find and pay for parking. When cars learn to find and pay for parking, parking demand will respond to parking prices more accurately and drivers will be able to save money by parking a few blocks from their destination and walking the rest of the way (*The High Cost of Free Parking*, Chapter 18).

License plate recognition systems may become the future of parking management as cities move toward virtual payments by cell phones or connected cars, and doing away with on-street meters may completely change the parking game for governments (Chapter 34). Wireless payments for parking are also more resilient after natural disasters, like a flood, because there is no on-street meter hardware to repair.

Better technology can also reduce the hassle in paying for parking, which is often as important as the price of parking. A friend once told me that she avoids going downtown because of the difficulty of finding a parking spot, estimating how long she'll be there, preparing beforehand by making sure she has coins, and having to leave after an arbitrary time limit. Anywhere else in the city, she can give no thought to the logistics of parking. It's not so much the cost of parking (because it's not expensive), it's the bother and threat of a costly ticket if she lingers too long at a store or a restaurant. Getting the prices right and making payments simple are both important in parking management. Parking should be friendly but not free.

If curb parking isn't properly priced, it won't be properly used. With performance parking prices, drivers will find convenient places to park just as easily as they find convenient places to buy gasoline. Before they buy a car, people will have to consider how much they will have to pay for parking, just as they now consider the costs of the car itself, gasoline, insurance, registration, and repairs. And anyone who thinks about driving a car will have to consider the cost of parking at the destination. Parking will become a natural part of the market economy.

Transportation network companies (Uber and Lyft) and driverless cars are two new technologies that can reduce the demand for parking.

Reduced car ownership will reduce the political support for off-street parking requirements, and a reduced parking supply can increase the price of all parking. Shifting toward market-priced parking will therefore hasten the shift toward shared and driverless cars.

Any shift from privately owned cars to shared and driverless cars will convert the fixed costs of ownership (including parking) into marginal costs of driving or being driven. If driverless and shared cars increase vehicle travel, however, they will increase traffic congestion and thus make it even more important to charge the right price for using the roads—the lowest price that will prevent traffic congestion. The technology for congestion pricing is already here, and cities such as London, Singapore, and Stockholm already use it. As with charging for parking, the problem of charging for roads is not technical but political. To solve the political problem, cities might consider Traffic Benefit Districts, which are similar to Parking Benefit Districts, except the revenue comes from congestion tolls rather than from curb parking (*The High Cost of Free Parking*, Appendix G; King, Manville, and Shoup 2007).

Price Therapy

If performance prices for on-street parking don't work well, a city can easily revert to fixed prices, but off-street parking requirements have major, almost irreversible, effects. To use a medical analogy, performance prices resemble physical therapy while parking requirements resemble major surgery. Because physical therapy is much cheaper and does much less damage if it turns out to be the wrong choice, many physicians first recommend physical therapy to see if it can resolve a problem before they resort to drugs or surgery. Planners should try price therapy first before they require asphalt and concrete to solve parking problems.

City planners have diagnosed a shortage of free parking as a failure of the market to supply enough parking spaces. Their recommended remedy has been to require more off-street parking, which has a high cost in money, distorted land use, and disfigured cities. Because the demand for free parking is so much higher than the demand for market-priced parking, cities must require many more off-street spaces than the market would provide if the scarce on-street spaces were priced properly. The ample supply of required off-street parking then leads to more cars and driving, which increase traffic congestion and create the demand for wider roads. The original misdiagnosis of too few off-street parking spaces rather than a failure to price on-street parking properly has weakened cities and harmed the environment. The resulting traffic congestion has led many people to blame cars

as the source of the problem. Cars can produce many more private benefits, far fewer social costs, and much more public revenue if cities price driving and parking properly.

Converting Free Private Parking into Paid Public Parking

If cities remove off-street parking requirements, drivers who visit a new business without free parking will be tempted to park in the lot of another nearby business that does provide free parking. Most businesses with free parking do not want to police their lots and chase away drivers who are not their customers, so they understandably want cities to require new businesses to provide ample off-street parking.

Preventing unauthorized drivers from parking in a free lot is difficult, but businesses in some cities have found a new way to solve the problem without off-street parking requirements. They contract with commercial parking operators to manage their lots as paid public parking and split the resulting revenue (*The High Cost of Free Parking*, 700–701). Customers and employees continue to park free, but noncustomers must pay, and the formerly free-for-everyone lot begins to earn revenue. When a business is closed, all its parking spaces are available to the public. This arrangement generates revenue and increases the supply of public parking available for drivers who want to visit nearby businesses (Figure I-6).

Figure I-6 Private parking converted to public parking

A major difficulty with metering the spaces in private lots has been the difficulty of enforcing the drivers' responsibility to pay at the private meters. If private operators cannot issue enforceable tickets for violations, the only legal way to ensure compliance is to boot or tow the violators, which is expensive, inconvenient, and unpopular with both drivers and merchants. Toronto has solved this problem by allowing private parking operators to issue municipal parking tickets for meter violations in private parking lots (Toronto By-Law No. 725-2004). The private operators must send their staff to complete a required private parking enforcement course, and the city then deputizes these staff to issue municipal tickets. The city specifies the required signage, sets the fines for violations, and receives all the ticket revenue. The private operators therefore issue tickets to secure compliance, not to profit from the ticket revenue. Drivers can contest the municipal tickets issued in private lots in the same way they contest tickets at on-street meters. As another solution, a city's parking enforcement officers can give tickets for violations at off-street meters in the same way they enforce on-street meters, and the city keeps the revenue. Extending municipal enforcement to formerly free private parking takes advantage of the existing public protocol for enforcement and creates a new public-private partnership that benefits both parties.

One big advantage of converting free private parking into paid public parking is that drivers demand fewer spaces when parking is priced. If cities remove off-street parking requirements, large free parking lots can morph into smaller paid parking lots, releasing valuable land for infill development. The market will slowly reclaim land from free parking and people will displace cars.

Everybody wants something for nothing, but we should not promote free parking as a principle for urban planning, transportation, or public finance. Using prices to manage parking can produce a host of benefits for cities, transportation, and the environment. The right prices can produce the best parking for the most people at the lowest possible cost. Information wants to be free but parking wants to be paid for.

We now have the right technology to charge the right prices for parking. Part III of the book focuses on using Parking Benefit Districts to get the right politics.

III. PARKING BENEFIT DISTRICTS

Elected officials may know that charging market prices for curb parking is the right thing to do, but they don't know how to get reelected after they do it. Market-priced parking looks like an expensive way to commit political suicide. Because people are so used to free parking, the

notion that there might be something wrong with it sounds crazy. And if market prices for curb parking work so well, why haven't more cities tried them? When it comes to parking, many people don't like the way things are but they also don't like change. What can create the desire for change?

The money fed into a parking meter seems to disappear into thin air, and no one believes the revenue will benefit them personally. There is pain but no gain. Politically, it is as if the meter money were incinerated. Most drivers will place a higher value on the immediate, tangible benefit of free parking than on the possible long-run benefits of better public services or lower taxes that would be made possible by charging higher prices for curb parking. Cities can transform the politics of parking, however, by using the curb parking revenue to pay for public services in the neighborhoods that generate it. If each neighborhood keeps its curb parking revenue to pay for local public services, residents may support desubsidizing curb parking because they want a safer and cleaner neighborhood.

To create local support for user-paid parking in commercial areas, some cities have created Parking Benefit Districts that spend the meter revenue for public services in the metered areas. These cities offer each district a package that includes both priced parking and better public services. Everyone who lives, works, visits, or owns property in a Parking Benefit District can see their meter money at work, and the package is much more popular than the meters alone. Localizing the parking revenue will generate local support for the parking meters.

Parking Benefit Districts are a form of "political engineering," a term coined in the 1970s to describe the practice of spreading the contracts for a military project, such as a new fighter plane, to as many congressional districts as possible to maximize the number of Congress members who support the project. Parking Benefit Districts resemble political engineering because they spread the cost of paying for parking among a dispersed array of drivers and concentrate the public benefits within the metered districts (*The High Cost of Free Parking*, Chapter 17). The right parking policies require the right parking politics.

The pain of paying for parking is individual but many of the benefits are collective. The best way to show these collective benefits to local stakeholders is to spend the revenue for added public services on the metered streets. If each neighborhood keeps the parking revenue it generates, a powerful new constituency for market prices can emerge—the neighborhoods that receive the revenue. These stakeholders who benefit from the public services paid for by parking meters will know who they are, and they will see a good reason to support the meters. These same stakeholders will lose something they value if the city doesn't

charge for curb parking, so they may support operating the meters as long as needed to manage the demand for parking.

If drivers from outside the neighborhood pay for curb parking and the revenue benefits the residents, charging for curb parking can become a popular policy rather than the political kryptonite it is today. Rather than an eat-your-spinach edict that drivers must pay for parking, Parking Benefit Districts can persuade residents that they want to charge for parking. Some people will always object to any new policy, especially those who think that cities should never do anything for the first time, but the new revenue for local public services can change minds.

To explain this proposal, I will summarize how it can work in two settings: commercial areas and residential neighborhoods. Chapters 16 and 17 in *The High Cost of Free Parking* explain the proposal in full.

Parking Benefit Districts in Commercial Areas

The best way to recommend parking reforms may be not to mention parking at all. It's not enough to say the city got parking wrong because cities get a lot of things wrong. Instead, planners can ask the stakeholders in a district what new services they want the government to provide. For example, their highest priority may be to repair broken sidewalks. After the stakeholders have identified their highest priorities but have no way to pay for them, planners can suggest a Parking Benefit District as a way to finance the public services. The stakeholders can then decide whether to install parking meters to pay for the public services they want. For the stakeholders, parking reform is the means, not the end.

I am not saying that putting parking revenue into a city's general fund won't produce public benefits. The important political issue is the *perception* of benefits. Residents won't *see* any benefits if the revenue goes into the general fund, but they can easily see the benefits if the revenue stays on the metered streets. If meter money pays for sidewalk repairs the stakeholders want, for example, they may recommend meters they previously opposed when they thought the money would disappear into a black hole. This scenario describes what happened in 1992 when Pasadena, California, installed parking meters and dedicated the revenue to pay for public services on the metered streets.

Pasadena's original business district, Old Pasadena, had become a commercial Skid Row, with wonderful historic buildings in terrible condition. The city proposed installing meters to regulate curb parking, but the merchants opposed them. They knew their employees occupied many of the most convenient curb spaces but feared that meters would drive away the few customers they had. To defuse opposition, the city offered to spend all the meter revenue to pay for public investments

in Old Pasadena. The business and property owners quickly agreed to the proposal because they saw the direct benefits, and the desire for public improvements soon outweighed the fear of meters.

Businesses and property owners began to see the parking meters in a new light—as a source of revenue. They agreed to the then high rate of $1 an hour for curb parking and to operating the meters in the evenings and on Sunday. The city also liked the arrangement because it wanted to improve Old Pasadena. The city needed $5 million to finance an ambitious plan to invest in Old Pasadena's streetscape and to convert its alleys into walkways with access to shops and restaurants, and the meter revenue would pay for the project. In effect, Old Pasadena became a Parking Benefit District. The business and property owners bought into parking meters because they were bought off with the resulting revenue.

The city worked with Old Pasadena's Business Improvement District to establish the boundaries of the Old Pasadena Parking Meter Zone (PMZ) where the parking meters were installed. Only the blocks with parking meters benefit directly from the meter revenue. The city also established the Old Pasadena PMZ Advisory Board, consisting of business and property owners who recommend parking policies and set spending priorities for the zone's meter revenues. Connecting the meter revenues directly to added public services and providing for local control are the two elements largely responsible for the parking program's success.

The city installed the parking meters in 1993 and borrowed $5 million to finance the Old Pasadena Streetscape and Alleyways Project, with the meter revenue dedicated to repaying the debt. The bonds paid for new sidewalks, street furniture, trees, and lighting throughout the area. The city turned dilapidated alleys into safe, functional walkways with access to shops and restaurants. Old Pasadena boomed and sales tax receipts shot up. Two other business districts in Pasadena then petitioned the city to install parking meters with revenue return to pay for public improvements (Chapter 44, and *The High Cost of Free Parking*, Chapter 16).

Parking meters have two natural sources of opposition—the drivers who park at the curb and the businesses these drivers patronize. That's why it is important to create support for the meters by localizing the revenue. If residents, merchants, and property owners can see the public improvements, they are more likely to support the meters. Without this local public spending financed by the meters, it is hard to see the benefits of meters. Drivers who have an easier time finding a curb space don't know it's because of the meters. Drivers who suffer less traffic congestion don't know it's because there is less cruising for free parking. People who breathe cleaner air don't know

it's because less cruising produces less pollution. A city has to show direct local benefits to convince most people that they want parking meters. To paraphrase William Butler Yeats, advocates for parking meters lack all conviction while the opponents are full of passionate intensity. Parking Benefit Districts can create the conviction to charge for curb parking and deflate the opposition's passionate intensity.

Performance pricing converts the costs of cruising into public benefits. People can see some of the benefits, such as clean sidewalks and trimmed street trees. Other benefits—reductions in traffic congestion, air pollution, and carbon emissions—remain invisible. The visible benefits of parking-financed local public services will create popular support for parking reforms that also have widespread invisible benefits. When it comes to political support for priced parking, merchants are far more interested in a sustainable business district than in a sustainable planet.

Doing the right thing is more important than doing something for the right reason, and the best way to get people to do what's right collectively is to make it right for them to do it individually. Parking Benefit Districts can give individuals a personal incentive to do what's right for society. I do not mean to advocate or celebrate self-interest, but rather to recognize it and take advantage of it. Cities can let the market some work for the public good—the approach that Brookings Institution economist Charles Shultze termed "the public use of private interest."

Parking Benefit Districts are multiplying. Chapters 44–50 describe the great range of public improvements funded by Parking Benefit Districts in Austin and Houston in Texas, in Pasadena, Redwood City, and Ventura in California, and in Mexico City. Pasadena uses meter money to clean the sidewalks every night and to pressure wash them twice a month (see Chapter 44). Ann Arbor, Michigan, and Boulder, Colorado, use meter money to provide free transit passes for all workers in the central business district. (It's hard to believe these cities would be better off with hard-to-find free curb parking and expensive public transit rather than free public transit and easy-to-find priced curb parking.) Ventura uses the parking meters to provide free Wi-Fi for all the residents, businesses, and visitors on the metered streets. Neighborhoods with parking meters have free Wi-Fi and neighborhoods with free curb parking don't (see Chapter 46). If parking meters become synonymous with free Wi-Fi in cities around the world, Parking Benefit Districts may spread quickly.

Parking Benefit Districts and Business Improvement Districts

Curb parking revenue is a benefit in search of a beneficiary; the funds need the right recipient to generate political support for market

prices. In commercial areas, Business Improvement Districts (BIDs) are logical recipients. In a BID, property owners tax themselves to pay for supplemental public services beyond the level provided citywide. In essence, BIDs are a form of cooperative capitalism, and they provide public services that cities either do not provide (such as sidewalk cleaning) or do not provide at a satisfactory level (such as security). BIDs have a good track record, their legality is well established, and their operating principles are familiar to public officials and business owners. BIDs are therefore ready-made recipients for curb parking revenue.

Earmarking curb parking revenue to fund BIDs and giving the BIDs a say in setting the parking prices for their area will encourage business-like management of the parking supply. Each district can examine how other districts deal with curb parking, and they can weigh the benefits and costs of alternative policies. BIDs can recommend the parking meter rates because their members observe the meter occupancy every day on every block, and they see the effects of occupancy on their businesses. BIDs have every incentive to get the prices right because their members will be the first to benefit from good decisions and the first to suffer from bad ones.

Cities can even give BIDs full responsibility for managing the parking meters, setting the prices, and collecting the revenue. Bangalore, India, adopted this strategy in its Brigade Road business district (Center for Science and the Environment 2016, 31). The Brigade Shops Establishments Association paid for installing parking meters for 85 spaces. Half the meter revenue goes to the city government and the other half remains in the district to pay for managing the system. Business leaders have strong incentives to charge appropriate prices at the meters. If the price is too high and there are many open parking spaces, the empty spaces fail to deliver customers to the shops. If the price is too low and there are no open spaces, customers will complain about a parking shortage and the district could earn more revenue by charging higher parking prices. Allowing BIDs to manage on-street parking may be especially appropriate in cities where inefficiency or corruption have blocked managing on-street parking properly.

Equity Concerns

An equity problem arises if business districts with higher parking demand have higher parking prices and therefore earn more money for public services. One way to avoid this inequity is to use what in public finance is called "power equalization." The city can return equal revenue per parking meter to every Parking Benefit District.

Suppose the average citywide meter revenue is $2,000 per meter per year. In this case, the city can offer to spend $1,000 a year per meter for added public services in every Parking Benefit District and spend the other $1,000 a year for citywide public services. All neighborhoods with Parking Benefit Districts will therefore receive equal revenue per meter for added public services and all neighborhoods without Parking Benefit Districts will receive better public services. The federal and state governments use similar formulas to distribute gasoline tax revenues among lower levels of government. For example, the federal government distributes most federal gasoline tax revenue to the states that generate it (return to source) and distributes the rest to fund special projects throughout the country.

Parking Benefit Districts that earn more revenue will subsidize those that earn less, and they will also subsidize the rest of the city. This sharing arrangement retains the local incentive to install parking meters but distributes the revenue equally, which seems fairer than the usual policy of installing parking meters in the parts of the city that have parking problems and spending the revenue everywhere else.

There are also worldwide equity concerns. When I was speaking in Florida recently, residents told me they worry that rising sea levels caused by global warming will flood their cities (the highest point in the state is only 345 feet above sea level). I said that free parking is a subsidy for burning fossil fuels. I then asked whether they thought global warming would be a smaller problem if cities around the world charged market prices for curb parking and eliminated off-street parking requirements. Or should all cities instead adopt Florida's policies of free curb parking and high off-street parking requirements? If Floridians won't reform their own parking policies to help forestall global warming, why should the rest of the world worry about flooding in Florida?

Florida is strengthening its coastal defenses to protect against rising sea levels. Charging for parking can generate the needed funds and also reduce carbon emissions. It's much easier to price curb parking than to price carbon emissions, so advocates for carbon pricing should also advocate parking reforms. Climate change's potential to harm everyone on Earth makes underpriced curb parking and off-street parking requirements unwise not only locally but also globally.

Parking requirements reflect planning for the present but not for the future (*The High Cost of Free Parking*, 171–73). They are politically desirable in the short term but the opposite of what cities need in the long term. Parking requirements create great places for cars but not great cities for people or a great future for the Earth.

Religious Concerns

Beyond equity concerns about dedicating revenue to pay for public services on the metered streets, there are also religious concerns (*The High Cost of Free Parking*, 494–95). San Francisco provides an important lesson. In January 2013 the city began to operate its parking meters on Sunday from noon to 6 p.m. Previously, it was hard to find an open curb space on Sunday in almost every commercial area in the city. Some drivers would park in metered spaces on Saturday afternoon and not move their car until Monday morning. After the meters began operating on Sunday, it became much easier to find curb parking near neighborhood businesses on Sunday.

Nevertheless, responding to complaints that church members had to "pay to pray," in April 2014 the city resumed free parking on Sunday. If San Francisco had shared some of the Sunday meter revenue to improve public services in the metered neighborhoods, the prospect of losing public services could have generated political support for the Sunday metering. Merchants and residents who benefited from the public services might have insisted on the separation of church and parking. The laws of supply and demand do not miraculously stop operating on Sunday.

Some pastors may fear that charging for parking on Sunday will reduce church attendance, which it can. In his book, *Going Clear,* about the links between Scientology and Hollywood, Lawrence Wright related how L. Ron Hubbard recruited movie stars to publicize the church. One recruitment strategy was to establish the Celebrity Center in Hollywood, where notable actors and musicians had their own private entry. A few celebrities did join, but one got away:

> Rock Hudson visited the Celebrity Center but stormed out when his auditor had the nerve to tell him he couldn't leave until he finished his session, although the matinee idol had run out of time at his meter. The exemplary figure that Hubbard sought eluded capture (Wright 2013, 140).

An Enabling Act for Parking Benefit Districts

If state legislation does not authorize Parking Benefit Districts, some cities may hesitate to establish them. In 2016, the Massachusetts legislature passed the Parking Advancements for the Revitalization of Communities (PARC) Act, which explicitly authorizes cities to charge market prices for on-street parking and to establish Parking Benefit Districts to spend the revenue (Section 22A of Chapter 40 of Massachusetts General Laws).

> [Parking] fees shall be established and charged at rates determined by the city or town. Rates may be set for the purpose of managing the parking supply. The revenue therefrom may be used for acquisition, installation, maintenance and operation of parking meters and other parking payment and enforcement technology, the regulation of parking, salaries of parking management personnel, improvements to the public realm, and transportation improvements including but not limited to the operations of mass transit and facilities for biking and walking.
>
> A city or town may establish one or more parking benefit districts, as a geographically defined area, in which parking revenue collected therein may be designated in whole or in part for use in said district through a dedicated fund. … A parking benefit district may be managed by a body designated by the municipality, including but not limited to a business improvement district or main streets organization.

The act's language is simple. Cities can charge demand-based prices for curb parking and spend the revenue to improve public services in the metered districts. Other states could adopt similar legislation that will encourage cities to establish Parking Benefit Districts.

The PARC Act took effect in October 2016. In January, 2017, Boston launched two performance parking pilot programs. The meter rates are based on parking demand, and the city will reinvest a share of the revenue increase in the metered districts (City of Boston 2017).

Cities in Massachusetts now have a great opportunity to create Parking Benefit Districts because the state had previously prohibited cities from using meter revenue to fund general public services. The new Parking Benefit Districts will therefore not take meter revenue away from other public services, which should simplify the politics of establishing them.

The Massachusetts legislation combines San Francisco's demand-based pricing policy and Pasadena's revenue-return spending policy. This combination can depoliticize curb parking in two ways. First, the pricing policy relieves the city council of voting on every price change. The city council sets policy by choosing an occupancy goal, and then gives the parking authority the responsibility to set prices to achieve this goal. Parking demand then sets the prices, without political intervention. Second, dedicating meter revenue to paying for public services on the metered streets relieves the city council of voting whether to install every new meter. If the city council returns all or a share of meter revenue to pay for services on the metered blocks, neighborhoods can decide for themselves whether they want parking meters and added public services. Parking Benefit Districts are a bottom-up rather than a top-down policy.

Parking Benefit Districts in Residential Neighborhoods

Cities have established Parking Benefit Districts in commercial areas but have not yet done so in residential neighborhoods. Most on-street parking spaces are in residential neighborhoods, however, and the greatest opportunities for public improvement may lie in these neighborhoods (see Chapter 51).

In residential neighborhoods, Parking *Benefit* Districts resemble conventional Parking *Permit* Districts except for three features. First, the number of permits is limited to the number of curb spaces. Second, drivers pay market prices for the permits. Third, the permit revenue pays for neighborhood public services. In neighborhoods where most residents park off-street or do not own a car, the prospect of better public services—a cleaner and greener neighborhood—may persuade a majority to support charging market prices for on-street parking.

On-street parking revenue can pay to clean and repair sidewalks, add security, bury overhead utility wires, and provide other public services. Few residents will pay for curb parking but everyone will benefit from the public services. Because cities do not now charge for on-street parking in residential neighborhoods, Parking Benefit Districts will not take any existing revenue away from other public services. Money will come right out of the ground.

Richer neighborhoods that have higher parking prices will earn more money for public services. Cities can avoid this inequality and still provide the local incentive to charge for parking permits by using power equalization as proposed earlier for commercial Parking Benefit Districts. All neighborhoods that charge market prices for their curb parking will receive equal revenue for public services (see Chapter 50).

If a block has 20 parking spaces that can each earn $2,000 a year to pay for public services, for example, free parking subsidizes parking on the block by $40,000 a year. If the city already charged market prices for curb parking on a block and spent an extra $40,000 a year to improve public services, few would say the city should spend $40,000 a year less on public services in order to subsidize hard-to-find parking for 20 cars. Some activities justify public subsidies, but parking a car is not one of them.

If laid end to end, the 3 million curb parking spaces in New York would stretch almost halfway around the Earth and would cover about 17 square miles of land, 13 times the size of Central Park. Because 97 percent of New York's on-street parking is unmetered, the parking subsidy must be astronomical. If only half of New York's 3 million on-street spaces were in Parking Benefit Districts and they earned an average revenue of $2,000 per space per year (that's only $5.50 per day),

the total revenue would amount to $3 billion per year. Half of that could go to improve neighborhoods, and the other half could pay for citywide services, such as renovating the subway system (see Chapter 51).

Many people seem to think the best reason to do anything is that it's best for them individually. Planners should therefore be realistic about devising policies so the stakeholders receive personal benefits. Parking Benefit Districts can produce many social benefits, ranging from less traffic to less global warming, but these benefits alone will not persuade many people that they ought to pay for parking. The narrow local benefits like cleaner and safer sidewalks in front of their homes can persuade self-interested residents to support market prices for curb parking. The streets will be paved with possibilities.

Parking Benefit Districts are evolutionary, not revolutionary, and they require little change in the way cities conduct business. In commercial areas, they combine Business Improvement Districts and parking meters. In residential areas, they combine Parking Permit Districts and market prices. Parking Benefit Districts combine familiar institutions in a new way, and they are bold but understandable. The more they look like what cities already do, the more they can make a radical change. And they can be tried out a few blocks at a time.

Some critics may complain that charging for curb parking will privatize public land, but the government owns the land, uses a market to set the prices, and spends the revenue on public services. Parking Benefit Districts are markets without capitalism, more like market socialism than privatization, and they are small scale and democratic (*The High Cost of Free Parking*, 447–450). Market prices can't solve every problem, but they can solve the parking problem.

Parking Benefit Districts won't be necessary if a city's public infrastructure is in good shape, public transport works well, traffic is not congested, the air is safe to breathe, housing is affordable, and neighborhoods are walkable. But many cities do have serious problems that we have been trying to fix for decades, and we are now on the sixth or seventh generation of fixes. We have tried every silver bullet: urban renewal, high-rise public housing, rotating restaurants, world fairs, public parking structures, development banks, and light rail. Parking Benefit Districts are modest and cheap in comparison to previous fixes and are worth a try.

Residential Parking Benefit Districts and Affordable Housing

Almost every proposal for new housing in an old neighborhood now comes bundled with a dispute over scarce curb parking. Current residents fear that new residents will compete for the free on-street parking and make their already difficult parking situation worse. As a

result, cities require new housing to provide enough off-street parking to prevent crowding the curb. But if parking permits restrain parking demand to fit the available curb supply, new housing will not crowd the curb. Cities will then be able to eliminate their off-street parking requirements and allow developers to provide less parking and more housing.

Most residents probably won't ask for a PBD because they want to increase the supply of affordable housing, but they may ask for a PBD because they want to improve their neighborhood. As a byproduct, removing off-street parking requirements will remove a major barrier to affordable housing. Granny flats (also called second units and backyard cottages) are an especially promising form of housing that can flourish if cities remove off-street parking requirements in residential neighborhoods. Second units provide a simple, relatively inexpensive, and nearly invisible way for homeowners to create additional housing.

On-street parking congestion is not the only reason why neighbors may object to second units, but it is a major reason and a politically powerful one. If cities can remove parking as an objection to second units, the other issues (such as concerns about noise or attracting low-income residents to high-income neighborhoods) can be discussed more openly. Parking Benefit Districts that mitigate the parking concerns of neighbors can thus reduce the political opposition to second units (*The High Cost of Free Parking* 462–64; Brown, Mukhija, and Shoup, 2018).

CONCLUSION

Charging market prices for curb parking makes perfect economic sense, but politics are even more important. John Kenneth Galbraith warned about the danger of focusing on the economics and neglecting the politics:

> In making economics a non-political subject, neoclassical theory destroys the relation of economics to the real world. In that world, power is decisive in what happens. And the problems of that world are increasing both in number and in the depth of their social affliction. In consequence, neoclassical and neo-Keynesian economics regulates its players to the social sidelines. They either call no plays or use the wrong ones. To change the metaphor, they manipulate levers to which no machinery is attached (Parker 2005, 616).

Parking Benefit Districts combine economics and politics in a new way to gain popular support for parking reforms.

Assembling support for parking reform is like opening a combination lock: each small turn of the dial seems to achieve nothing, but when everything is in place the lock opens. Diverse interests across the political spectrum can support a combination of three reforms: (1) remove off-street parking requirements, (2) charge market prices for on-street parking, and (3) spend the revenue for neighborhood public services.

On-street parking is a missing market in the economy, and neighborhoods are a missing level of government. Charging the right prices for on-street parking can fill the gap in the market, and Parking Benefit Districts can fill the gap in government (*The High Cost of Free Parking*, Chapter 17). Conservatives often want more markets, while liberals often want more government. Parking Benefit Districts give both more markets and more government, but a new kind of both: market prices for on-street parking and parking-financed public services.

Conservatives sometimes underestimate how individual choices have collective consequences, and liberals sometimes underestimate how economic incentives affect individual choices. Parking Benefit Districts can mediate between these two views. Charging market prices for curb parking will lead drivers to make travel choices that benefit society, and the parking-financed public services will benefit everyone in the neighborhood.

Repealing off-street parking requirements and replacing them with market prices for on-street parking may at first glance seem a herculean task, almost like Prohibition or the Reformation, too big an upheaval for society to accept. Nevertheless, the repeal-and-replace strategy should attract voters across a wide political spectrum. Conservatives will see that it reduces government regulations and relies on market choices. Liberals will see that it increases spending for public services. Environmentalists will see that it reduces energy consumption, air pollution, and carbon emissions. New Urbanists will see that it enables people to live at higher density without being overrun by cars. Developers will see that it reduces building costs. Drivers of all political stripes will see that it guarantees convenient curb parking. Residents will see that it improves their neighborhoods. Elected officials will see that it depoliticizes parking, reduces traffic congestion, allows infill development, and provides public services without raising taxes. Finally, urban planners can devote less time to parking and more time to improving cities.

The following 51 chapters explain how repealing off-street parking requirements, replacing them with the right prices for on-street parking, and spending the resulting revenue to improve neighborhood public services may be the cheapest, fastest, and simplest way to improve cities, the economy, and the environment, one parking space at a time.

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