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PRACTICE PARKING REFORM

The Pseudoscience of Parking Requirements

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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.

American 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.

Parking requirements 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 drive a long way back home, parking free everywhere. In *The High Cost of Free Parking*, published by the American Planning Association in 2005, I argued that parking requirements increase traffic congestion, pollute the air, encourage sprawl, raise housing costs, degrade urban design, prevent walkability, damage the economy, and penalize everyone 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 that parking requirements are poisoning our cities with too much parking.

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

THREE PARKING REFORMS

Reform is difficult because parking requirements do not 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 recommended 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 space.
- **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 political support to charge the right prices for curb parking. If cities charge the right prices to produce one or two open spaces on every block, no one can say there is a shortage of curb parking. If there is no shortage of curb parking, cities can then remove their off-street parking requirements. Finally, removing off-street parking requirements will increase the demand for curb parking, which will increase the revenue to pay for public services.

THE MOST EMOTIONAL TOPIC IN TRANSPORTATION

Everyone wants to park free, and most people consider parking a personal issue, not a policy problem. Rational people quickly become emotional about parking, 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 snap judgments about urgent fight-or-flight issues, such as how to avoid being eaten. The reptilian cortex is said to govern instinctive behavior like aggression, territoriality, and ritual display, which all play a role in parking.

Parking clouds people's minds, shifting analytic faculties to a lower level. 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 thinking about parking policies, and ample free parking is seen as a goal that planning should produce. If drivers paid the full cost of their parking, it would seem too expensive, so we expect someone else to pay for it. But a city where everyone happily pays for everyone else's free parking is a fool's paradise.

Few people are interested in parking itself, but parking strongly affects issues 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 free curb parking congests roads, pollutes the air, and adds greenhouse gases. Do people really want a drive-in dystopia more than they want affordable housing, clean air, walkable neighborhoods, good urban design, and a sustainable planet?

Reforms in planning for parking may be the cheapest, quickest, and most politically feasible way to achieve many social, economic, and environmental goals.

THE EFFECTS OF PARKING REQUIREMENTS

Cities have 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 theory and data, planners set parking requirements for hundreds of land uses in hundreds of cities—the 10,000 commandments of planning for parking. Planners have adopted a veneer of professional language to justify the practice, but planning for parking is learned only on the job and it is more a political activity than a professional skill.

Consider what 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 pollution, fuel consumption, and CO_2 emissions

Stuart Cohen, TransForm

Figure 1. An office park on the border of Milpitas and San Jose, California.

The High Cost of Parking Requirements

Cost is an especially important unknown. A recent study found that 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 (Shoup 2014). Retailers pass this high cost on to all shoppers, regardless of how they travel. People who cannot afford a car pay more for their groceries so richer people can park free when they drive to the store.

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 every apartment regardless of its size or quality, the required parking disproportionately increases the cost of low-income housing. One study found that minimum parking requirements raise housing costs by 13 percent for families without cars (Gabbe and Pierce 2017).

Drivers pay for their cars, fuel, tires, maintenance, repairs, insurance, and registration fees, but they usually don't pay for parking. Who does pay for the parking? Everyone, including people who cannot afford a car. All of life's necessities cost more in order to provide free 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 is more expensive. Parking requirements are well-intentioned, but good intentions do not guarantee good results or mitigate unintended harm.

The required parking takes up a lot of space. Parking lots typically have about 330 square feet per space. Because there are at least three off-street parking spaces per car in the United States, 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. The area of off-street parking per car is thus larger than the area of housing per human.

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 causes cities to expand. The higher the parking requirements, the stronger the dark energy that spreads cities out and rips them apart. Typically, the process of setting the parking requirements is closer to astrology than astronomy.

Parking Requirements in Practice

When I am invited speak in a city, I start with an aerial view of a site in the city with too much parking, such as this photo of an office park in San Jose, California (Figure 1). It looks like a giant parking lot with a few buildings.

I then show a page from the city's parking requirements, which are so precise and so specific for so many land uses that most people probably assume planners carefully study parking (Table 1). Instead, planners are winging it. Planners are not oracles who can divine the demand for parking. I have never met a city planner who could explain why any parking requirement should not be higher or lower. To set parking requirements, planners usually take instructions from elected officials, copy other cities' parking requirements, or rely on unreliable surveys. Parking requirements are closer to sorcery than to science.

Next, I show the size of the parking lots resulting from the city's parking

TABLE 1. SELECT PARKING REQUIREMENTS FOR "ENTERTAINMENT AND RECREATION" USES IN SAN JOSE, CALIFORNIA

Use	Vehicle Parking Required
Arcade, amusement game	1 per 200 sq. ft. of floor area
Batting cages	1 per station, plus 1 per employee
Bowling establishment	7 per lane
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 rehearsal space	1 per 250 sq. ft. of floor area
Poolroom/billiards establishment	1 per 200 sq. ft. of floor area
Private club or 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

requirements. For many land uses, the parking lots are bigger than the buildings they serve (Figure 2). There is more space for parking than for people. For example, San Jose, California, requires a restaurant to provide a parking lot that is more than eight times the size of the restaurant itself. The requirements provide parking everywhere anyone wants to go, but they also create places where few people want to be.

Most 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 to fill the available space, and more parking leads to more cars. Nevertheless, planners usually assume that cars and people come in fixed proportions, and they often require parking in proportion to people: per beautician, dentist, mechanic, nun, student, teacher, or tennis player. If parking were priced to cover its cost, people would own fewer cars and drive less.

Parking requirements are not only ridiculous but also dangerous. They make cities friendly to cars but not to people—drivable but not walkable. As Jane Jacobs 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 traffic and free parking. We also want safety, health, walkability, prosperity, and pleasure.

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. One study found that in 2015 the average construction cost (excluding land cost) for parking structures was about $24,000 per space for aboveground parking and $34,000 per space for underground parking.

By comparison, the U.S. Census of Wealth and Asset Ownership in 2015 found that the median net worth (the value of assets minus debts) was $110,500 for white households, $19,990 for Hispanic households and $12,780 for black households. One space in a parking structure, therefore, costs more than the entire net worth of more than half of all Hispanic and black households in the country.

Free curb parking and off-street parking requirements have spread the city out so that most people need a car to get a job, go to school, and shop. In a misguided attempt to provide free parking for everyone, cities encourage poor people to buy cars they can ill afford, often financing them by subprime loans at high interest rates. Free parking has the veneer of equality, but it increases inequality. It is enormously wasteful and grossly unfair.

Assumptions and 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, hard to understand, and expensive to maintain. 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.

Parking requirements are like barnacles on a ship, accumulating one at a time and slowing the ship's progress. They 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. That is, 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.

Parking requirements create many disputes about how many parking spaces a building "needs," with each side making solemn claims backed by dubious evidence. Consider the opposite approaches in the Los Angeles and San Francisco central business districts. For a concert hall downtown, Los Angeles requires, as a minimum, 50 times more parking spaces than San Francisco allows as its maximum. This difference helps to explain why downtown San Francisco is much more exciting than downtown Los Angeles.

If physicians in one city prescribed bloodletting and physicians in another city prescribed blood transfusion to treat the same disease, everybody would demand to know what is going on. Nobody notices when Los Angles requires parking and San Francisco restricts it. Ultimately, minimum parking requirements increase traffic

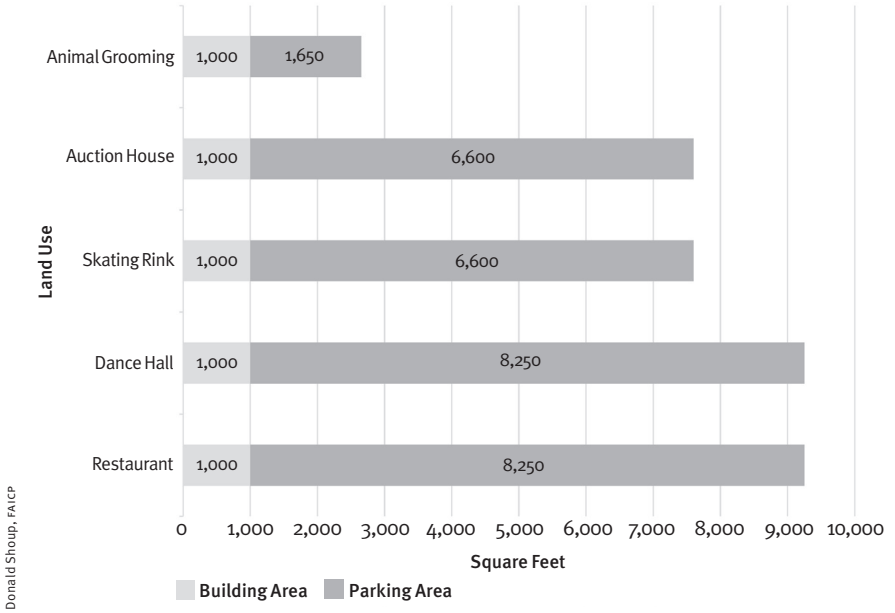


Figure 2. Required ratios of building-to-parking area for select uses in San Jose, California.

because all the cars drawn to the required parking spaces clog the roads. Los Angeles has more parking spaces per square mile and worse traffic congestion than any other city in the United States. Minimum parking requirements began as a solution but have become the problem, a disease masquerading as a cure.

If planners assume that every new resident will come with a car, they require developers to provide enough off-street parking to house all the cars. Ample free parking then ensures that most residents do want a car. Parking requirements thus result from a self-fulfilling prophecy. Parking requirements increase the number of cars, and planners then use the large number of cars to justify the need for higher parking requirements.

Planners often use "motivated reasoning" to justify the parking requirements required by elected officials who want enough parking to ensure that citizens won't yell about a shortage of free parking. Planners must then fashion 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 rationalize them and feign expertise they do not have.

When it comes to parking requirements, planners have used Pandora's box as their toolkit. These requirements result from complex political and economic forces, and planners are not in full control. But they do enable the pseudoscience, and the public bears the cost.

Every Sin Is Forgiven if It Is Done With Our Permission

When a city requires off-street parking, city officials have something to offer developers—a planning variance that reduces the parking requirement. The city can then allow a business to provide fewer than the required number of parking spaces because of special circumstances. Some planners may believe that minimum parking requirements are needed as a bargaining chip 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. 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, but they can easily bargain away parking because it is obviously not necessary.

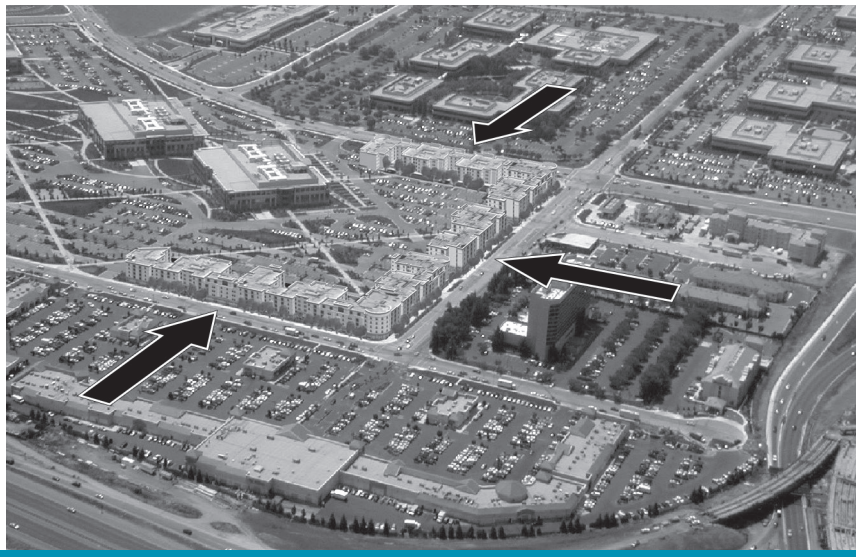
Just as the medieval Catholic Church sold indulgences for the remission of sins, cities can sell planning variances for the remission of parking requirements. In Dostoyevsky's *The Brothers Karamazov*, the Grand Inquisitor of Seville explained why the Church was popular even though it threatened Hell as the punishment for minor sins: "Every sin will be forgiven if it is done with our permission." Removing minimum parking requirements will remove the temptation to sell variances that allow sinfully few parking spaces.

How can cities remove their minimum parking requirements and still have the bargaining power the 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. I do not recommend establishing 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 maximum limits than of minimum requirements.

THE UPSIDE OF MINIMUM PARKING REQUIREMENTS

The upside of parking requirements is that removing them can do so much good. Figure 1 showed the asphalt desert created by excessive parking in Silicon Valley. 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, congested traffic, and polluted air. Building housing on the periphery of parking lots would help to solve all these problems. Figure 3 suggests what could happen if San Jose removed parking requirements and allowed housing on the periphery of



Stuart Cohen, TransForm

Figure 3. The same office park from Figure 1, digitally altered to illustrate how removing parking requirements could result in liner apartment buildings on previously developed sites.

parking lots. A 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 fronted 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 allow commuters to walk to work—a rare out-of-car experience.

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 pay for parking. 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 forbid. The new housing cannot cause gentrification or displacement because no one lives on the parking lots now. Converting parking spaces into housing sites will also reduce traffic congestion because more people will walk, bike, carpool, or ride transit to their destinations. Oversized parking lots offer the possibility of something much better, but parking requirements prevent anything else. 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. If we reform our misguided planning, vast parking lots can evolve into real communities. Economic objectives often conflict with environmental objectives, but parking reforms can serve both.

The money we now spend 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, plumbers, and roofers. Importing fewer cars and hiring more people to build infill development will boost the whole economy.

Some critics argue that removing an off-street parking requirement amounts to "social engineering" and a "war on cars." Instead, off-street parking requirements are a war for cars. All the required parking spreads buildings apart so more people need cars to get around. Removing a requirement that restaurants provide 10 parking spaces per 1,000 square feet of floor area is no more a war on cars than removing a requirement that everyone must eat in restaurants 10 times a month would be a war on restaurants.

When it comes to off-street parking, I'm pro-choice. Cities should not require developers to provide unwanted parking spaces. Parking requirements were a bad idea, poorly executed, and they prevent many good results. Figure 3 shows that an upside of the mess we have made is 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.

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. If cities manage on-street parking properly, they won't need to require off-street parking. Information wants to be free, but parking wants to be paid for.

PROOF IT CAN BE DONE

When *The High Cost of Free Parking* was published, half the city planning profession thought I was crazy and the other half thought I was daydreaming. Since then, several cities—including Buffalo, New York; Hartford, Connecticut; Minneapolis, and San Francisco—have removed all parking requirements, and many others have removed their downtown requirements. Mexico City has converted its minimum parking requirements into maximum parking limits while leaving the numbers almost unchanged. What once seemed politically impossible may slowly become the new normal.

For example, in July 2019, Houston nearly doubled the size of its downtown off-street parking exemption area, redefining it as a "market-based parking area" (§26-471(b)(6) & §26-472). In this area, developers decide how much parking to provide, and at least one shopping center developer has already decided to provide a public plaza instead of more parking (DiMiceli 2019).

CONCLUSION

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. Three reforms can open the parking combination lock: (1) remove off-street parking requirements, (2) charge market prices for on-street parking, and (3) spend the revenue for neighborhood public services.

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, this strategy should attract voters across a wide political spectrum. Conservatives will see that it reduces government regulations. Liberals will see that it increases public spending. Environmentalists will see that it reduces energy consumption, air pollution, and carbon emissions. Urban designers will see that it enables people to live at higher density without being overrun by cars. Developers will see that it reduces building costs. Residents will see that it improves their neighborhood public services. Drivers of all political stripes will see that it guarantees convenient curb parking. Elected officials will see that it depoliticizes parking, reduces traffic congestion, allows infill development, and provides public services without raising taxes. Finally, planners can devote less time to parking and more time to improving cities.

Repealing off-street parking requirements, charging the right prices for on-street parking, and using revenue to provide public services will improve cities, the economy, and the planet, one parking space at a time. Cities will look and work much better when prices, not planners and politicians, govern decisions about the number of parking spaces. Like the automobile itself, parking is a good servant but a bad master.

Note: This piece is adapted from the Introduction to *Parking and the City*, published by Routledge in 2018.

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DOES YOUR ZONING FOLLOW THE PSEUDOSCIENCE OF PARKING MINIMUMS?

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