


## Zoning has three basic elements

1. Permitted uses, such as residential, commercial and industrial zones
2. Permitted bulk-regulated by floor-area ratios, height limits, setbacks, and openspace requirements
3. Off-street parking requirements



## Ample free parking increases the demand for driving.

## San José's minimum parking requirements



Culver City's minimum parking requirements


Square feet of building and required parking
$\square$



## Survey of parking requirements for 660 land uses

## a

abattoir (see slaughterhouse)
accessory dwelling unit
administrative office (see office uses)
adult use
adult use, adult arcade
adult use, adult cabare adult use, adult motion picture theater
adult use, adult theate
adult use, book store
adult use, entertainment facility
adult use, massage parlor (see also massage establishment)
adult use, sex novelty shop
advertising agency (see also office use) agricultural use, unless otherwise specified (see also farm uses)
agricultural processing plant (see also industrial uses)
agricultural-related industry (see also agricultural use, unless otherwise specified)
agricultural sales and service use (see also farm supply store; feed store) aircraft charter servic
airport (see also airport terminal) airport hangar
airport, local/private use airport terminal (see also airport; transportation terminal)

## ambulance service

amphitheater (see also stadium) amusement enterprise (see also recreation facility uses)
amusement enterprise, indoor amusement enterprise, outdoor amusement park
amusement park, children's amusement park, water
ancillary use (sec accessory use) animal boarding facility
animal breeder establishment
animal grooming salon
animal hospital
animal sales establishment (see pet shop) animal shelter
animal training facility
antique shop (see also second-hand store) apartment (see dwelling, apartment uses) apartment hotel (see extended-stay hotel) apparel store (see clothing store) appliance and equipment repair
establishment (see also equipment uses)
appliance sales establishment
aquaculture use
aquarium
arboretum (see also botanical gardens; community garden)
arcade, amusement (see also amusement enterprise uses)
archery range (see also rifle range; shooting range)
arena (see stadium)
armory
art gallery (see also cultural uses)
art school (sec educational facilities, school

## for the arts)

art supplies store
artisan workshop (see also live-work studio) artist studio (see also artisan workshop; live work studio)
asphalt manufacturing facility (see also industrial use, heavy
assembly hall (see also auditorium; civic center)
assisted living (see elderly housing, assisted living)
asylum (see mental health facility)
athletic field (see also ball field;
grandstands; recreation facility uses)

## auction, automobile

auction house
auditorium (see also assembly hall; civic center)
automated teller machine (ATM)
automated teller machine (ATM), exterior, on bank property
automobile convenience store (sce gas station, mini-mart)
automobile dealership (see also motor vehicle sales establishment)
automobile graveyard (see automobile salvage yard; junk yard)
automobile impound facility (see also towing service)
automobile laundry (see car wash uses) automobile maintenance, quick service establishment (see also automobile repair service establishment)
automobile mall (see automobile dealership uses)
automobile parts store
automobile rental establishment (see also motor vehicle rental establishment) automobile repair service establishment (see also gas station; motor vehicle repair service establishment; tire store and
service establishment)
automobile salvage yard (see also junk yard)
automobile service station (see also gas station)
b
bait shop (see also retail use, unless otherwise specified)

## bakery

bakery, wholesale
ball field (see also athletic field
grandstands; recreation facility uses)
ballroom (see also banquet hall; dance hall)
bank (see also accessory banking;
automated teller machine (ATM); credit union)
bank, drive-thru only (see also drive-thru use, unless otherwise specified)
bank with drive-thru (see also drive-thru
use, unless otherwise specified)
bank, without drive-thru
banquet hall (see also ballroom; dining room; meeting hall)
bar (see also beer garden; bottle club; brew pub; night club)
barber shop (see also beauty shop; personal services establishment)
baseball field (see ballfield)
basketball court
batch plant (see concrete production plant) bathhouse (sec also health spa; sauna bath) batting cage facility
beach, commercial
beach, community
beauty shop (see also barber shop; personal services establishment)
beauty school (see also educational facility; trade school)
bed and breakfast home
bed and breakfast inn (see also tourist home) beer garden (see also outdoor seating area) bicycle rental and repair shop
bicycle repair shop
bicycle sales shop
billiard hall (see pool hall)
big box retail establishment (see also
department store; shopping center uses) bingo hall
blood donor center
blueprinting shop (sec also copy shop;
printing and publishing facility)
boarding house (see also lodging house;
rooming house)

## battoir (see slaughterhouse

accessory dwelling unit

- 1 additional space, on the same zone lot (Greensboro, N.C., pop. 223.891)
$\int \cdot 1$ per attached accessory dwelling unit, in addition to other required spaces (Washoe County, Nev., pop. 339,486)
- 1 per bedroom (Reno, Nev., pop. 180,480
- 1 space (Encinitas, Calif., pop. 58,014)
- 1 space per unit (Palo Alto, Calif., pop. 58,598)
. 2 spaces per unit; such space must have convenient access to a street (Smithfield, Va., pop. 6,324)


## $\stackrel{\rightharpoonup}{\Delta}$ <br> Bicycle Parking Standard: 0.5 per 1,000; 1 per 20 seats (Tigard, Ore., pop. 41,223

## adult use adult arcade

. 1 parking space shall be provided for every 2 occupants per the allowable occupant load as established by the city's building official or fire mashall, whichever standard is greater. In addition, 1 parking space shall be provided for each employee or independent contractor on the maximum shift. (Santa Clarita, Calif., pop. 151,088)

## adult use, adult cabaret

1 parking space shall be provided for every 2 occupants per the allowable occupant load as established by the city's building official or fire mashall, which ever standard is greater. In addition, 1 parking space shall be provided for each employee or independent contractor on the maximum shift. (Santa Clarita, Calif., pop. 151,088)
1 space per 25 square feet of gross floor area (Garden Grove, Calif., pop. 165,196

administrative office (see office uses)
adult use

- 0.3 per seat, plus 3.3 per 1,000 square feet of gross floor area (Tampa, Fla., pop. 303,447)
- 1 per 60 square feet (Henderson, Nev., 175,381)
- 10 per 1,000 square feet (Hickory, N.C., pop. 37,222)
- 12 per 1,000 square feet (St. Mary's County, Md., pop. 86,211)
Minimum: 1 per 500 square feet above first 2,400 square feet
Maximum: 1 per 150 square feet (Pittsburgh, Pa., pop. 334,563)
Minimum: 1 per 250 square feet of gross floor area Maximum: 1 per 200 square feet of gross floor area (Glenville, N.Y., pop. 28,183)
. 1 per 200 square feet (Fort Wayne, Ind., pop. 205,727) 10 per 1,000 square feet, but not less than 15 (Clark County, Neo., pop. 1,375,365)


## adult use, adult motion picture theate

1 off-street parking space for each 10 seats or equivalent (San Bruno, Calif., pop. 40,165)
1 parking space shall be provided for every 2 occupants per the allowable occupant load as established by the city's building official or fire mashall, which ever standard is greater. In addition, 1 parking space shall be provided for each employee or independent contractor on the maximum shift. (Santa Clarita, Calif., pop. 151,088) 1 space for each 8 fixed seats or 1 space for each 100 square feet of spectator assembly area not containing fixed seats (Seattle, Wash., pop. 563,374)

## A parking requirement sampler

Barber shop
Beauty shop
Nunnery
Rectory
Sex novelty shop
Gas station
Swimming pool
Mausoleum

2 spaces per barber
3 spaces per beautician
1 space per 10 nuns
3 spaces per 4 clergymen
3 spaces per 1,000 square feet
1.5 spaces per fuel nozzle

1 space per 2,500 gallons
10 spaces per maximum number of interments in a one-hour period

## PERIODIC TABLE OF THE ELEMENTS


(1) Pure Appl. Chem., 73. No. 4, 667-683 (2001) Relative atomic mass is shown with five significant figures. Forelemonts have no stable
nuclides, the value enclosed in brackets indicates the mass number of the longest-lived isotope of the element.
Howover three such eloments (Th, Pa, and U) So have a characteristic terrestrial isotopic composition, and for these an atomic weight is tabulated.

| LANTHANIDE |  |  |  |  |  |  |  | Copyright $01998-2003$ EniG (erie9kt-split.hr) |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
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| 89 (227) | $90 \quad 232.04$ | 91231.04 | 92238.03 | 93 (237) | 94 (244) | $95 \quad$ (243) | $96 \quad(247)$ | 97 (247) | $98 \quad$ (251) | 99 (252) | 100 (257) | 101 (258) | 102 (259) | 103 (262) |
| $A C$ | Th | $P a$ | $U$ | $\mathrm{ND}$ | $\mathbb{P}$ | Aum | Cmol | $B 1 \mathbb{K}$ | $\mathbb{C}$ | ES | ITImo | MI@l | $N(1)$ | Kio |
| actinium | THORIUM | PROTACTINIUM | URANIUM | NEPTUNIUM | PLUTONIUM | AMERICIUM | CURIUM | BERKELIUM | CALIFORNUM | EINSTEINIUM | FERMIUM | MENDELEVIUM | NOBELIUM | LAWRENCIUM |

## Phrenology



## Parking Requirements

Every space is sacred.
Every space is great.
If a space is wasted,
God gets quite irate.
Every space is wanted.
Every space is good.
Every space is needed
In your neighborhood.
Adapted from Monty Python's The Meaning of Life

## Planners who set minimum parking requirements:

Don't know how much the required parking spaces cost.
Don't know how much the parking requirements increase the cost of housing and everything else.
Don't know how the parking requirements affect urban design.
Don't know how the parking requirements affect congestion.
Don't know how the parking requirements affect air pollution.
Don't know how the parking requirements affect fuel consumption and $\mathrm{CO}_{2}$ emissions.
Have no training in how to set a parking requirement.
Are politicizing what should be business decisions.
Are governmentalizing what should be market choices.


## Parking versus Housing

The United States has at least 1,300 square feet of parking space per car. The United States has about 720 square feet of housing space per person. Cars have more space for parking than humans have for housing. Most parking is free for cars, and most housing is expensive for people. Free parking encourages us to buy cars, consume energy, congest traffic, and pollute the air.
Expensive housing burdens everyone and makes some people homeless. We have our priorities for parking and housing the wrong way around. Cities that want more housing and less traffic should stop requiring off-street parking for all housing.

## Converting garages into apartments

## Street-facing garage apartments



## Will garage apartments push cars onto the street?



Garages can be much more valuable for people than for cars. By legalizing garage apartments, cities can take advantage of a housing opportunity that is hiding in plain sight. We can reduce the homeless problem one garage at a time.


## Buffalo's new parking requirements

### 8.3 VEHICLE ACCESS \& PARKING

### 8.3.1 General

A. Off-Street Parking Not Required. The provision of off-street vehicle parking is not required. Where provided, off-street vehicle parking must comply with the standards of this section.

## Hartford Eliminates Parking Minimums Citywide

By Angie Schmitt Dec 13, 2017 , 46


This building was converted to apartments in downtown Hartford after parking mandates were eliminated. Photo: Google Maps

## Minneapolis Moves to Eliminate Mandatory Parking



Photo: Minneapolis 2040

| $f$ |
| :--- |
| $y$ |
| $y_{+}$ |

The Minneapolis City Council has approved a bold plan that would dramatically increase walkability and other hallmarks of urban living by eliminating mandatory parking that has encouraged car ownership for years.
"In a win for housing affordability and walkability, San Francisco's Board of Supervisors voted last week to eliminate the city's minimum parking requirements." Next, San Francisco should charge market prices for curb parking and use the revenue to put the overhead wires underground.


USA.STREETSBLOG.ORG

## San Francisco Eliminates Parking Minimums

San Francisco is the latest city to eliminate minimum parking requirements...

In downtown, a maximum of one parking stall will be allowed per residential unit, with the added restriction that parking must be built below ground if it is built at all.


ARCHPAPER.COM
San Diego eliminates parking requirements for transit-adjacent projects

## Why are cities removing minimum parking requirements?

"to promote the creation of downtown apartments" (Greenfield, Massachusetts)
"to see more affordable housing" (Miami)
"to meet the needs of smaller businesses" (Muskegon, Michigan)
"to give business owners more flexibility while creating a vibrant downtown" (Sandpoint, Idaho)
"to prevent ugly, auto-oriented townhouses" (Seattle).

## What will happen if cities remove parking requirements?





## The solution is in the site.



# Effects of removing parking requirements 

and building job-adjacent housing on former parking lots

Create jobs
Increase the housing supply
Reduce time spent commuting
Reduce spending on cars and fuel
Reduce traffic congestion and air pollution
Increase the demand for smart parking technology
Slow climate change

## Three Reforms in Parking Policy

1. Charge the right price for curb parking.

The lowest price that will leave one or two vacant spaces on each block-performance-based pricing
2. Establish Parking Benefit Districts to spend the meter revenue in the neighborhoods that generate it.
Revenue return will make performance-based prices for curb parking politically popular.
3. Reduce or remove off-street parking requirements. Do not require additional parking when a building's use changes.
Freedom from parking requirements will allow higher density and new uses for old buildings.

## 1. Demand-based Parking Prices

Demand-based prices adjust over time to maintain a few vacant spaces.
The goal is to keep about 85 percent of the parking spaces occupied all the time.
The lowest price a city can charge and still leave one or two open spaces on every block.
If one curb space are open on each side of each block, everyone will see that convenient parking is available everywhere.
The only thing worse than paying for parking is having no parking.

## Before SFpark




Block B - Nearby Location-2 Open Spots






## SFpark:

## Putting Theory Into Practice

Post-launch implementation summary and lessons learned


## Average meter prices declined with SFpark

After the 10th rate change in April 2013, only 9 blocks had reached the $\$ 6$ per hour cap, and 179 had fallen to the $\$ 0.25$ per hour minimum.
Many blocks had been overpriced in the morning.
Parking should be free if many spaces remain empty at the zero price.
Performance pricing leads to higher prices only if prices are so low that no spaces are open.

## Greenhouse gas emissions declined

Daily greenhouse gas emissions (metric tons)
Beffre vs. after
Pllot vs. control areas | Wbokdays gam to epm


## Double parking declined

Double parking vs. occupancy
Plot and control areas, 2010-2013


## Change in sales tax revenue, FY2006-2013

Food product, general retail and miscellaneous; chain stores excluded

Pilot




## - ㄷTAL

## Stall: 05769

## Press Number on Keypad to Select Options:

## 1) 2 Hours $\$ 7,00$

2) $1 H \operatorname{Hr} 30 \mathrm{Min} \$ 5.00$
3) 1 Hour $\$ 3,00$
4) 40 Minutes $\$ 2,00$
5) 20 Minutes $\$ 1.00$















## The right price

Should the price be higher?
Should the price be lower?
The Goldilocks principle of parking prices. "I know it when I see it."

Can anyone think of a better way to set the price of curb parking?

## Information wants to be free.

 Parking wants to be paid for.Cruising for Parking

TABLE 11-5
CRUISING FOR PARKING

| Year | City |  | Share of <br> traffic <br> cruising | Average <br> search <br> time |
| :--- | :--- | :--- | :---: | :---: |
|  |  |  | (percent) | (minutes) |
| 1927 | Detroit |  | $19 \%$ |  |
| 1927 | Detroit |  | $34 \%$ |  |
| 1934 | Washington |  | 8.0 |  |
| 1962 | New Haven |  | $17 \%$ |  |
| 1965 | London |  | 6.1 |  |
| 1966 | London |  | 3.5 |  |
| 1966 | London |  | 3.6 |  |
| 1977 | Freiburg |  | $74 \%$ | 6.0 |
| 1984 | Jerusalem |  | 9.0 |  |
| 1985 | Cambridge |  | $30 \%$ | 11.5 |
| 1993 | Cape Town |  | 12.2 |  |
| 1993 | New York | $8 \%$ | 7.9 |  |
| 1993 | New York |  | 10.2 |  |
| 1993 | New York |  | 13.9 |  |
| 1997 | San Francisco |  | 6.5 |  |
| 2001 | Sydney |  | 6.5 |  |
| 2005 | Los Angeles |  | $68 \%$ | 3.3 |
| 2007 | New York |  | $28 \%$ |  |
| 2007 | New York |  | $45 \%$ |  |
| 2008 | New York |  | 3.8 |  |
| 2011 | Barcelona |  | $18 \%$ |  |
| Average |  | $\mathbf{3 4 \%}$ | $\mathbf{7 . 5}$ |  |

ROUTES OF CERTAIN CRUISING VEHICLES IN THE VICINITY OF CICERO, MILWAUKEE, AND IRVING PARK CONSTRUCTED FROM OBSERVATIONS MADE ON THE SIX APPROACHES TO THE INTERSECTION OF THESE STREETS

7:00 P.M. TO 9:30 P.M.-THURSDAY, MARCH 30, 1939

OBSERVED 6 TIMES


OBSERVED 9 TIMES


EGEND: mes POINT OF OBSERVATION

OBSERVED 6 TIMES


OBSERVED 8 TIMES


OBSERVED II TIMES


From the Report: "A Plan to Relieve Traffic Congestion in the Portage Park Retail Shopping Center." A Survey by City of Cbicago, Cbicago Motor Club, Cbicago Surface Lines, April 1939

FIGURE 4-Observed Routes of Cruising Vehicles


## Probabilty of finding parking space





## Competing uses for the curb

Parking
Loading zones
Bus stops
No stopping
Bike lanes
Bike stations
Outdoor restaurants

## Sidewalk cafés

 in curb parking lanes

## Bike stations in curb parking lanes



## Converting free private parking into paid public parking

Monday - Friday 7am-5pm PERMIT PARKING ONLY
Paid Parking All Other Times Violators Will Be Ticketed / Booted or Towed



## Progressive Parking Prices in Albany

| Parking Time | Price per Hour | Total Price |
| :---: | :---: | :---: |
| First hour | \$1.25 | \$1.25 |
| Second hour | \$1.25 | \$2.50 |
| Third hour | \$1.50 | \$4.00 |
| Fourth hour | \$1.75 | \$5.75 |
| Fifth hour | \$2.00 | \$7.75 |
| Sixth hour | \$2.25 | \$10.00 |
| Seventh hour | \$2.50 | \$12.50 |
| Eighth hour | \$2.75 | \$15.25 |
| Ninth hour | \$3.00 | \$18.25 |
| Tenth hour | \$3.25 | \$21.50 |

## Progressive parking fines

First violation in a year
Second violation
Third violation
Fourth violation
Fifth violation
Further violations

Warning
\$10
\$20
\$40
\$80
\$100

## Parking Discounts for Residents

In Miami Beach, nonresidents pay $\$ 4 /$ hour at parking meters, but residents pay only $\$ 1 /$ hour.
In Monterey, the first two hours of parking in city garages are free for residents. Calgary gives parking discounts for smaller cars. Madrid gives parking discounts for low-pollution cars.

## 2. Parking Benefit Districts




"Take away a few more parking spaces."


## 1978 Plan for Old Pasadena

"The area's been going downhill for years."
"It's a bunch of dirty old buildings."
"It's filthy."
"It's Pasadena's sick child."
"The area is unsafe."

## Old Pasadena Now



## Parking meters with revenue return

- City of Pasadena offered to return all parking meter revenue to Old Pasadena
- Merchants and property owners immediately agreed to install meters
- 690 meters operate until midnight, and on Sunday
- Meters yield $\$ 1.2$ million a year for Old Pasadena's 15 blocks, about $\$ 80,000$ per block.

Old Pasadena. We've come a long way. This might seem silly to some people, but if not for our parking meters, its hard to imagine that we'd have the kind of success we're enjoying. They've made a huge difference. At first it was a struggle to get people to agree with the meters. But when we figured out that the money would stay here, that the money would be used to improve the amenities, it was an easy sell."

Marilyn Buchanan, Chair,
Old Pasadena Parking Meter Zone Advisory Board

## Turning Small Change into Big Changes







## Pasadena Sales Tax Revenue



## Parking Benefit Districts

Transportation management tool.
Reduces traffic congestion, air pollution, and fuel consumption.
Economic development tool.
Makes curb parking available, increases sales and property tax revenue, and employs people.

# Effects of removing parking requirements 

and building job-adjacent housing on former parking lots

Create jobs
Increase the housing supply
Reduce time spent commuting
Reduce spending on cars and fuel
Reduce traffic congestion and air pollution
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Slow climate change

# Pan-Ideological Support for Market-Priced Curb Parking 



Political support for market-priced curb parking, parking benefit districts, and no off-street parking requirements
Liberals will see that it increases public spending.
Conservatives will see that it relies on markets and reduces government regulation.
Environmentalists will see that it reduces energy consumption, air pollution, and carbon emissions. Businesses will see that it unburdens enterprise.
New Urbanists will see that it improves urban design and enables people to live at high density without being overrun by cars.

Libertarians will see that it increases the opportunities for individual choice.

Property-rights advocates will see that it reduces regulations on land use.

Developers will see that it reduces building costs.
Residents will see that it pays for neighborhood public improvements.
Affordable housing advocates will see that it reduces the cost of building new housing.
Neighborhood activists will see that it devolves public decisions to the local level.

Local elected officials will see that it reduces traffic congestion, encourages infill redevelopment, and pays for local public services without raising taxes.



# All of us, if we are reasonably 

 comfortable, healthy and safe, owe immense debts to the past. There is no way, of course, to repay the past. We can only repay those debts by making gifts to the future.Jane Jacobs

We--you and I, and our government-must avoid the impulse to live only for today, plundering, for our own ease and convenience, the precious resources of tomorrow.

Dwight Eisenhower

As our case is new, so must we think anew, and act anew.

## Abraham Lincoln

Smart Parking

## Reform depends on leadership from all of you.

