

ZONING PRACTICE

OCTOBER 2014



AMERICAN PLANNING ASSOCIATION

➔ ISSUE NUMBER 10

PRACTICE PEDAL POWER



10

Shifting the Regulatory Gears to Promote Bicycling

By Jeffrey Beiswenger, AICP

In many communities across the United States, riding a bicycle can be an uphill battle against a strong headwind.



➞ Bicycle commuting is on the rise in many cities.

Poorly connected street and trail networks and a lack of bicycle infrastructure often make riding for recreation or transportation inconvenient or even dangerous. Retooling your locality's regulatory framework can help make bicycling safer, more pleasant, and practical.

Now is a good time to pay closer attention to the needs of bicyclists. Bicycling for commuting, recreation, and everyday travel is increasing in popularity around the country, and many cities and counties have already made major investments in bicycle infrastructure to make this mode of travel safer and more convenient.

This trend is perhaps most noticeable in larger metropolitan areas, where more workers are commuting by bicycle. In fact it has become so popular in some areas (e.g. Portland, Oregon, and California's Silicon Valley) that businesses are providing indoor bicycle rooms, shower facilities, and other amenities in order to accommodate employees and even attract talent. But the potential societal benefits of bicycling aren't limited to big cities. Shifting trips from private automobiles to bicycles reduces vehicle miles traveled and greenhouse gas emissions, and bicycling is a great form of exercise.

While publicly funded infrastructure is an important piece of the puzzle, many communities overlook the significant role local development regulations can play in fostering bike-ability. Drawing from examples of communities that have already obtained higher levels of "pedal power," this article explores how cities and counties can use development regulations to support safe and convenient bicycling.

'SHIFTING' DEMOGRAPHICS

In order to increase bicycling, it is important to know how ridership has changed over time.

ASK THE AUTHOR JOIN US ONLINE!

Go online during the month of October to participate in our “Ask the Author” forum, an interactive feature of Zoning Practice. Jeffrey Beiswenger, AICP, will be available to answer questions about this article. Go to the Zoning Practice section of the APA website at www.planning.org/zoningpractice and follow the links to the Ask the Author forum. From there, just submit your questions about the article to the active thread. After each thread closes at the end of the month, the archived questions and answers will be available through the Ask the Author forum.

About the Authors

Jeffrey Beiswenger, AICP, is planner with the City of Rohnert Park, California, and has previously worked as a planning consultant. He has authored zoning regulations in 12 different states. He wrote the November 2013 edition of Zoning Practice entitled “Powering Down Zoning Regulations.”

The number of U.S. bike trips more than doubled from 1.8 to 4 billion per year from 1990 to 2009 (Pucher et al. 2011). Of particular interest to planners is the shift from recreational bicycling to utilitarian bicycling. Between 2008 and 2012, about 786,000 Americans commuted by bicycle, up from about 488,000 in 2000 according to the U.S. Census Bureau’s American Community Survey (ACS). That jump is the largest percentage increase of all commuting modes tracked by the 2000 Census and the 2008–2012 ACS (McKenzie 2014).

Even though the increases in bicycle commuting have been significant, the mode share is still low, with only one percent of all trips taken in the United States by bicycle. However, some larger cities have seen dramatic shifts. For example, Portland, Oregon, had the highest bicycle commuting rate at 6.1 percent in 2009, up from 1.8 percent in 2000; Minneapolis also had a significant increase, with bicycle commuting rates jumping from 1.9 percent to 4.1 percent (Milne and Melin 2014). According to the ACS, in 2012 the large metropolitan areas with the highest bicycle commuting rates were Portland (6.1 percent), Minneapolis (3.6 percent), San Francisco (3.3 percent), Seattle (3.4 percent), and Washington, D.C. (2.9 percent). Small college towns have the highest rates of bicycling commuting, with Davis, California (22.1 percent), Boulder, Colorado (9.9 percent), Eugene, Oregon (8.3 percent), Berkeley, California (8.0 percent), and Cambridge, Massachusetts (6.8 percent) with the highest rates in the nation. What is significant about communities with the highest rates of bicycle commuting is that they have all sought to specifically promote bicycling through engineering, education,

encouragement, enforcement, and evaluation (“Bicycle Friendly America: How We Did It” 2014).

Data suggest that if infrastructure is built to accommodate bicycling, rates should increase. Bicycling for utilitarian purposes, such as getting to work, school, shopping, visiting friends, and accessing public transit, increased from 43 percent to 51 percent from 2001 to 2009 (Pucher et al. 2011). But concerns about safe, convenient parking may be limiting this modal shift. An estimated 1.3 million bicycles are stolen in the United States each year (Milne and Melin, 2014). In a 2008 survey, San Francisco cyclists cited fear of theft as the number one reason that they did not bicycle more (Milne and Melin 2014). Evidence shows that

bicycle commuting increases when employees have access to bicycle parking and other amenities such as showers (Milne and Melin 2014). Considering that 40 percent of all trips cover two miles or less, more trips could be shifted from automobiles to bicycles if potential riders perceived cycling as a safe and convenient option (Dill et al. 2013).

More than 90 percent of people who use public transit walk to reach transit stops; meanwhile, only three percent bike to stops (Pucher et al. 2011). More workers would likely commute by bicycle if they could transfer to transit more easily and find a secure way to park or transport bicycles. Increasing commuting rates will require the provision of secure, sheltered bike parking at stations and coordination of



Jeffrey Beiswenger

➞ This street design in Boulder, Colorado, clearly identifies the space for pedestrians, bicycles, and vehicles.

bicycle parking with public transit stops (Pucher et al. 2011).

The increase in bicycle use and the related shifting demographic patterns indicate that regulations will need to be retooled to better serve bicyclists as they continue to grow in numbers. The remainder of this article focuses on regulatory strategies that make travel by bicycle safer and more convenient, such as street design standards that mandate space for cyclists on street or through grade-separated paths, street connectivity requirements, bicycle parking and storage facilities, and shower facilities and other bike-friendly amenities.

SAFE AND CONVENIENT TRAVEL

The presence of bicycling infrastructure is strongly associated with overall levels of bicycling, especially with bicycling to work, school, or shopping. One study of 35 large U.S. cities found that each additional mile of bike lane per square mile was associated with about a one percent increase in the share of workers commuting by bicycle. A more recent study using data from 90 large U.S. cities found that cities with 10 percent more bike lanes or paths had about two to three percent more daily bicycle commuters (Dill 2013). The type of infrastructure matters; bike lanes that are separated from motor vehicles, without making bicyclists travel too far out of their way, may be more effective for encouraging new bicyclists than on-street pavement markings (Dill 2013). The protected bicycle lane or cycletrack is an example of this.

Street Design Standards

Once a roadway is constructed, it can be difficult to allocate space for bicycle lanes, sidewalks, or other features—particularly if additional right-of-way is required. In many localities, local transportation or public works departments maintain existing public streets (or at least those not under the authority of a state department of transportation). Meanwhile, in cities and counties with greenfield or large-scale redevelopment opportunities, private developers often build new public streets. Locally adopted street design standards typically guide local road building, resurfacing, and configuration projects, whether they are initiated by a public agency or private developer.

Some communities codify street design standards in the design requirements section of their subdivision ordinance or land development code. Other localities adopt a stand-alone street design manual by reference.

More than 600 local and regional jurisdictions and 27 states have adopted complete streets policies that require all new road projects to accommodate all users—including bicyclists (National Complete Streets Coalition 2014). In the past, street design standards for bicycle infrastructure were limited to a striped bicycle lane between the gutter and vehicle travel lanes on collector or arterial roads. With the increased focus on complete streets, street design standards have evolved and may now include a full menu of bicycle-related infrastructure, including bicycle boulevards, sharrows, protected bicycle lanes, bike boxes, painted bicycle lanes, and other recent innovations.



Jeffrey Beiswenger

ⓘ Some bicyclists will chain to anything if convenient parking is not provided.

To illustrate, chapter 11 of Minneapolis's *Street and Sidewalk Design Guidelines* has details for various types of on- and off-street bicycle infrastructure (2010). The document cites the American Association of State Highway and Transportation Officials' rating system for the type of rider (A=comfortable in traffic, B= adults who prefers slower speeds or off-street trails, and C= children, seniors, and other vulnerable populations) and includes a set of design factors to help determine when a certain type of bike-related feature is needed.

Another good example is Louisville, Kentucky's *Complete Streets Manual*, which provides context-sensitive street design guidelines (2007). The guidelines within this document are particularly useful to jurisdictions with form-based codes. Chapter 4 of the manual includes a thoroughfare typology and specifies the bicycle facilities that should be provided within different character areas along a rural-to-urban transect.

Street Connectivity Requirements

One important component of bicycle infrastructure that is often overlooked is street connectivity. A well-connected street network will provide for a more effective bicycling (and walking) environment. With a highly connected street grid, most low-speed streets feel safe to cyclists, often making it unnecessary to direct riders to designated bicycle routes. Development regulations that establish maximum block sizes and interconnected streets help create a more balanced street network that will allow cyclists to travel more efficiently between destinations.

To illustrate, Cary, North Carolina's Land Development Ordinance requires a minimum internal connectivity index (i.e., the ratio of street segments to nodes) of 1.2 for residential development and requires most projects over five acres in size to provide a complete internal street network that is integrated into the existing street network (§7.10). The regulations require that streets have the ability to be extended into adjacent vacant land, and all streets, bike paths, and access ways must extend to the property line ("stub streets").

Meanwhile, Eugene, Oregon's Land Use Code sets a maximum block length of 600 feet and requires that proposed developments consider all existing and planned street connections within a quarter mile of the development site (§§9.6810&15).

There are also model connectivity ordinances available for inspiration. For example, in 2009 the Kentucky Transportation Cabinet produced a model code with commentary that discusses the importance of street connectivity and also provides model language for local development regulations. This model ordinance addresses internal connectivity for new development sites through a connectivity index and external connectivity through minimum connection intervals along development site boundaries.

SAFE AND CONVENIENT PARKING

While die-hard cyclists will lock a bike to almost anything (e.g., a fence, mailbox, parking meter, pipe, sign, or tree), many others are not comfortable parking outside of a designated area. Consequently, the widespread availability of safe and secure, not to mention legal, bicycle parking could have a profound impact on bicycling rates. Zoning codes and other development regulations play a significant role in encouraging or requiring the provision of dedicated bicycle parking facilities.

Bicycle Parking Ratios

Many cities and counties have incorporated minimum off-street bicycle parking requirements into their zoning codes. In practice, these requirements may be expressed as a ratio of parking spaces to square feet (similar to minimum automobile parking requirements) or as a flat minimum based on use. For example, Nashville, Tennessee, recently amended its zoning code to require a minimum of two publicly available bicycle parking spaces per nonresidential use, with additional spaces required for multifamily buildings and certain retail, office, and institutional uses (Ordinance No. BL2014-714).

The Nashville example is included here to illustrate that even a very simple regulatory change can help jurisdictions better serve cyclists. Examples of more comprehensive requirements are available from communities throughout the United States, including Minneapolis; Portland, Oregon; Seattle; New York; Austin, Texas; Lansing, Michigan; Davis, California; Boulder, Colorado; and many more. Some of these examples are highlighted below.

Design and Placement Standards for Bicycle Racks

When drafting new bicycle parking standards, it's important to consider both the design and placement of permissible bike racks. The most effective rack is one that supports the frame of the bike while allowing the frame and at least one wheel to be locked to the rack with a common U-lock. Racks installed too close to a wall or other obstruction may be unusable, and racks installed on narrow sidewalks or walkways may obstruct pedestrian or wheelchair access.

A number of communities have adopted standard specifications for bicycle racks to ensure that they are installed correctly. For

CLASSES OF BICYCLE PARKING

Bicycle parking is typically categorized into three different categories or classes:

Class 1. This type of bicycle parking provides building tenants (residents or employees) with protection from weather (wind, rain, and snow) and two levels of protection from theft, such as a locked room or cage with controlled access and racks within the enclosure to which bikes may be secured using a standard lock. In commercial buildings Class 1 parking is often provided along with showers and lockers.

Class 2. This type of bicycle parking consists of covered bicycle racks. These are intended for short-term use by visitors to a building. Racks are typically located outside but proximate to a primary building. The only deterrent to theft is the user's lock.

Class 3. This type of bicycle parking consists of uncovered bicycle racks. It is important that Class 3 spaces be proximate to building entrances since they are intended for short-term bicycle parking and should be as conveniently located as possible.



Jeffrey Beiswenger



Tommy Siller



Secondarywaltz/Creative Commons 4.0

➡ (Clockwise) A screened bicycle enclosure provides protection from the weather and theft; covered racks provide protection from weather but not, necessarily, theft; a row of uncovered bike racks at the University of Massachusetts at Amherst.

example, Alameda, California, requires all new racks to be installed in conformance with the city's Bicycle Facility Design Standards (§30-7.15.a), which include spacing and separation requirements from other bike racks, curb faces, walls, and other site elements (2013).

Long-Term Bicycle Parking Requirements

Covered and secure long-term bicycle parking facilities (and other closely related amenities) often make cycling more convenient for residents of multifamily buildings and workers who live within biking distance of their jobs. Consequently, an increasing number of localities are adding requirements for long-term bike parking

facilities, showers, and locker rooms to their zoning codes.

For example, Rockville, Maryland, requires long-term bicycle parking facilities for all multifamily dwellings and most nonresidential uses (§25.16.03). And it requires shower and locker facilities for office buildings larger than 50,000 square feet (§25.16.09.c.2.iv).

In San Francisco, many residential and nonresidential uses must provide Class 1 parking facilities (§155.2), and shower and locker facilities are required for new office development larger than 10,000 square feet and new retail development larger than 25,000 square feet (§155.4). Similarly, Santa Rosa, California,

requires long-term bike parking for all nonresidential uses and changing rooms, lockers, and showers for all nonresidential buildings more than 50,000 square feet (§20-36.090).

Zoning Incentives for Bicycle Parking

In some communities, mandatory short- or long-term bicycle parking requirements may be unnecessary or infeasible. For these localities, zoning incentives may be a more effective strategy to encourage the provision of bicycle parking and other bike-friendly amenities. A reduction in the number of required parking spaces for vehicles is one type of incentive. One vehicular parking space is large enough to accommodate 10 bicycle parking spaces, so if bicycle parking

is provided and used, it should reduce the number of spaces needed for automobiles.

To illustrate, Portsmouth, Virginia, allows the planning director to authorize up to a five percent reduction in the number of required off-street parking spaces for development that provides enclosed and secure bicycle parking spaces equal to at least five percent of the number of vehicular parking spaces along with employee shower and dressing areas (§40.1-5.1(K)(2)).

Meanwhile, Phoenix provides incentives within its downtown area for more bicycle parking and recognizes that the accommodation of bicycles is part of a broader sustainability approach. Developers that choose to include

amenities such as bicycle parking, changing rooms, showers, and air pumps (in combination with other sustainability features) can earn bonus density (§1223).

Encouraging Bike Sharing

Apart from requirements and incentives that primarily benefit individual bike owners, cities and counties can also use zoning to sanction or encourage bike-share systems. A local bike-sharing program may be operated by a public or private entity, and a few localities have already added bike-share facilities to their lists of permitted uses.

For example, both Madison, Wisconsin, and Kansas City, Missouri, permit bicycle sharing by right in all zoning districts (§10.33 and §88-322, respectively). Meanwhile, Denver authorizes a reduction in vehicle parking if shared bicycle parking is provided. Every five bike-share spaces earns a credit for one vehicle parking space (§10.4.5.2.B).

Comprehensive Bike Parking Standards

In 2012, San Francisco updated its bicycle parking requirements in response to a surge in ridership and demand for secure bicycle parking (Ordinance No. 183-13). The new law regulates long- and short-term bicycle parking based upon the anticipated need for different uses. A residential or office building would require more long-term bicycle parking spaces for residents and employees, respectively, while a retail store would require more short-term bicycle parking to accommodate shoppers. Features of the ordinance include separate requirements for long-term resident and employee parking and short-term visitor parking; separate requirements for multiple use categories based on anticipated generated bike trips; increased requirements for the provision of showers and lockers based upon use type and occupied floor area; location and placement requirements that prioritize easy and direct access to bicycle parking facilities; and illustrated design, layout, and clearance standards. The code also allows for the conversion of required vehicle parking for bicycle parking and authorizes in-lieu fees to satisfy portions of short-term bicycle parking requirements. The in-lieu fees can be used to provide for bicycle parking where needed.

Portland, Oregon, is another example of a community with comprehensive bicycle parking standards (§§33.266.200–220). Its code is well illustrated with detailed, dimensioned

CALGREEN'S BICYCLE-RELATED REQUIREMENTS

Since 2010, the California Building Code (CalGreen) has required bicycle parking as part of building permit issuance requirements. Here are the mandatory standards that all jurisdictions must require and voluntary measures that jurisdictions may choose to adopt as requirements:

Mandatory Requirements

5.106.4.1 Short-Term bicycle parking. If the project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 100 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack.

5.106.4.2 Long-Term bicycle parking. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of motorized vehicle parking capacity, with a minimum of one space. Acceptable parking facilities shall be convenient from the street and may include:

- 1. Covered, lockable enclosures with permanently anchored racks for bicycles;
- 2. Lockable bicycle rooms with permanently anchored racks; and
- 3. Lockable, permanently anchored bicycle lockers.

Voluntary Measures

A5.106.4.3 Changing rooms. For buildings with over 10 tenant-occupants, provide changing/shower facilities for tenant-occupants only in accordance with Table A5.106.4.3 or document arrangements with nearby changing/shower facilities.

TABLE A5.106.4.3

Number of Tenant-Occupants	Showers/Changing Facilities Required ²	2-Tier (12"x15"x72") Personal Effects Lockers Required ^{1,2}
0–10	0	0
11–50	1 unisex shower	2
51–100	1 unisex shower	3
101–200	1 shower stall per gender	4
Over 200	1 shower stall per gender for each 200 additional tenant-occupants	One 2-tier locker for each 50 additional tenant-occupants

1 One 2-tier locker serves two people. Lockers shall be lockable with either padlock or combination lock.
2. Tenant spaces housing more than 10 tenant-occupants within buildings sharing common toilet facilities need not comply; however, such common shower facilities shall accommodate the total number of tenant-occupants served by the toilets and include a minimum of one unisex shower and two 2-tier lockers.



➡ A B-Cycle bike sharing station in Denver.

graphics for the installation of bicycle parking areas, and it includes particularly innovative features, such as a reduction in vehicular parking requirements in exchange for additional bicycle parking spaces. Five bicycle spaces qualifies for a reduction of one automobile space, and a bike sharing station (accommodating eight

bikes) qualifies for a reduction of three automobile spaces. If bicycle parking does not fit on a development site, developers can pay a fee to be used for installing bicycle parking off-site (e.g., within the right-of-way). The code provides required parking ratios for short- and long-term bicycle parking based on land use.

REFERENCES

- Alameda (California), City of. 2013. *Bicycle Facility Design Standards*. Available at <http://alamedaca.gov/sites/default/files/document-files/bikestandardsfinalcompiled.pdf>.
- "Bicycle Friendly America: How We Did It." 2014. *American Bicyclist*, March-April. Available at <http://bikeleague.org/sites/default/files/March-April2014-FINAL.pdf>.
- Dill, Jennifer, Susan L. Handy, and John Pucher. 2013. "How to Increase Bicycling for Daily Travel." *Active Living Research*, Research Brief, May. Available at <http://activelivingresearch.org/how-increase-bicycling-daily-travel>.
- Kentucky Transportation Cabinet, State of. 2009. "Street Connectivity: Zoning and Subdivision Model Ordinance." Available at www.kapa.org/documents/Kentucky%20Connectivity%20Model%20Ordinance%20FINAL.pdf.
- Louisville/Jefferson County (Kentucky), Metro Government of. 2007. *Complete Streets Manual*. Available at www.louisvilleky.gov/bikelouisville/complete+streets.
- McKenzie, Brian. 2014. "Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012." American Community Survey Reports, U.S. Census Bureau. Available at www.census.gov/prod/2014pubs/acs-25.pdf.
- Milne, Andrea and Maggie Melin. 2014. *Bicycling and Walking in the United States 2014: Benchmarking Report*. Washington, D.C.: Alliance for Biking & Walking. Available at www.bikewalkalliance.org/storage/documents/reports/2014BenchmarkingReport.pdf.
- Minneapolis, City of. 2010. *Street and Sidewalk Design Guidelines*. Available at www.minneapolismn.gov/publicworks/transplan/comp/public-works_trans-plan_designguidelines.
- National Complete Streets Coalition. 2014. "Policy Atlas." Available at www.smartgrowthamerica.org/complete-streets/changing-policy/complete-streets-atlas.
- Pucher, John, Ralph Buehler, Dafna Merom, and Adrian Bauman. 2011. "Walking and Cycling in the United States, 2001–2009: Evidence From the National Household Travel Surveys." *American Journal of Public Health*, 101(1): 310–317. Available at www.policy.rutgers.edu/faculty/pucher/2001-2009.pdf.

CONCLUSIONS

Planners and zoning professionals can play an important role in fostering bike-friendly communities by assessing how well existing development regulations and design guidelines support safe and convenient bicycling. At the macro level, planners can help draft standards and guidelines that improve the bicycling environment at the community scale by helping to create complete streets, well-connected roadway networks, and comprehensive systems of bike lanes and paths. At the micro level, planners can also help adopt regulations that impact the provision of bicycle facilities and other bike-friendly amenities on individual development sites.

Cover image by tarasov/Thinkstock/iStock;
design concept by Lisa Barton

VOL. 31, NO. 10

Zoning Practice is a monthly publication of the American Planning Association. Subscriptions are available for \$95 (U.S.) and \$120 (foreign). James M. Drinan, JD, Executive Director; David Rouse, AICP, Managing Director of Research and Advisory Services.

Zoning Practice (ISSN 1548-0135) is produced at APA. Jim Schwab, AICP, and David Morley, AICP, Editors; Julie Von Bergen, Assistant Editor; Lisa Barton, Design and Production.

Missing and damaged print issues: Contact Customer Service, American Planning Association, 205 N. Michigan Ave., Suite 1200, Chicago, IL 60601 (312-431-9100 or customerservice@planning.org) within 90 days of the publication date. Include the name of the publication, year, volume and issue number or month, and your name, mailing address, and membership number if applicable.

Copyright ©2014 by the American Planning Association, 205 N. Michigan Ave., Suite 1200, Chicago, IL 60601–5927. The American Planning Association also has offices at 1030 15th St., NW, Suite 750 West, Washington, DC 20005–1503; www.planning.org.

All rights reserved. No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the American Planning Association.

Printed on recycled paper, including 50-70% recycled fiber and 10% postconsumer waste.

ZONING PRACTICE
AMERICAN PLANNING ASSOCIATION

205 N. Michigan Ave.
Suite 1200
Chicago, IL 60601-5927

1030 15th Street, NW
Suite 750 West
Washington, DC 20005-1503



HOW BIKE FRIENDLY ARE YOUR
COMMUNITY'S DEVELOPMENT
REGULATIONS?

10