

Back to the Future: Understanding the Evolution of the AASHTO Bike Guide



APBP CONFERENCE

August 26, 2019

Bill Schultheiss, PE

Jeremy Chrzan, PE, PTOE, LEED AP, APBP Board Member

Disclaimer

Everything we talk about today is from the **DRAFT** Guide, and is subject to change.

AASHTO Bike Guide schedule

- NCHRP 15-60 Complete: May 2018
- AASHTO Active Transportation Committee
 - 2 Rounds of Review/Revise 2018/2019
- AASHTO Geometric Design and Traffic Engineering Committees Review: Fall 2019
 - 2 Rounds of Review/Revise Fall 2019/ Early 2020
- State Balloting: Summer 2020?
- Publication: Fall 2020? Early 2021?

Revised AASHTO Chapter Outline (draft)

1. Introduction
2. Bicycle Operation & Safety
3. Bicycle Planning
- 4. Facility Selection**
- 5. Elements of Design**
6. Shared Use Paths
- 7. Separated Bike Lanes**
- 8. Bicycle Boulevards**
9. Bike Lanes & Shared Lanes
- 10. Traffic Signals and Active Warning Devices**
- 11. Roundabouts, Interchanges, and Other Intersections**
- 12. Rural Area Bikeways**
- 13. Structures**
- 14. Wayfinding**
15. Maintenance & Operations
16. Parking & End of Trip Facilities

A Historical Perspective on the AASHTO Guide and the Impact of the Vehicular Cycling Movement

Authors:

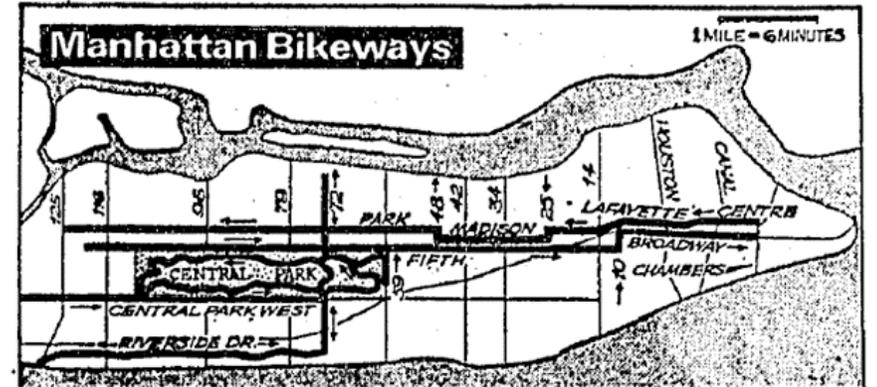
Bill Schultheiss, PE, Toole Design Group

Rebecca Sanders, PhD, Arizona State University

Jennifer Toole, Toole Design Group

https://tooledesign.com/wp-content/uploads/2018/10/TRB_Paper18-05962_HistoryofAASHTO_BikeGuide_TRB_rev.pdf

Lindsay Announces a System Of 'Bikeways' for Manhattan



New York Times October 3, 1971

A system of "bikeways"—posted street routes for Manhattan bicycle riders—was proclaimed yesterday by Mayor Lindsay.

A mayoral press spokesman was asked why Manhattan's heavily traveled streets, rather than sections in one of the other boroughs, had been chosen for the test.

"Because of the general enthusiasm for bike riding in Man-

hattan that they are traveling on a route suggested for bicycles.

The Mayor's announcement noted that more than a dozen civic organizations had helped to set up the program.

These included the Parks Council, the Municipal Art Society, the Citizens Union, Citizens for Cleaner Air, American Institute of Architects, Architectural League, City Club, Environmental Action Coalition, Friends of the Earth, New York

1960s Clean Air Activism



Cleveland, obscured by industrial smog in July 1973. Frank J. Aleksandrowicz/NARA



1970 Earth Day Protest NYC

Gas mask warning against polluted world of the future worn by Nancy Pearlman who organized 1970 Earth Day in Los Angeles.

Photo: Charles Young Research Library, UCLA

Bike Lane Protests – 1970s



San Francisco bicyclists protest in front of City Hall in 1972. They were seeking a dedicated bike lane on Market Street. Photo: Joe Rosenthal, The Chronicle

“Bicycle riders and neighborhood groups demanded yesterday that **plans for beautifying Upper Market Street be changed to reduce the number of lanes for cars and to provide facilities for bikes,**” the story by reporter Jerry Burns began. “Although one young rider nearly collided with a Cadillac on Polk Street, it was a pleasant and untroubled demonstration ...”

1970-1974 Bicycle Boom!

Bicycle Business Is Booming

By MARYLIN BENDER

"There is a recession going on but I forget it," Peter Kaszonyi said, sounding apologetic. "Until I talk to someone out of our industry," he added.

Mr. Kaszonyi is a marketing executive with the Schwinn Bicycle Company of Chicago and a considerable part of his time and energy is devoted to appeasing dealers' demands for his company's product. There are 1,700 such dealers for Schwinn, a 75-year-old, third generation, still family-owned concern, which sold out its 1,225-000-unit production for 1971 by last May.

Big Adult Market Is Bringing Euphoria To Industry

tial adult bicyclists in the United States (obviously just about everyone outside the cemetery population has been counted), of whom only a tiny segment owns its own equipment.

tising dollars into the Captain Kangaroo TV show. Schwinn has started advertising adult bikes, too, on the show "because 30 per cent of Captain Kangaroo's audience is mother behind her vacuum cleaner" says Ray Caparros, Schwinn's advertising manager. He has also been advertising in adult magazines and plans to increase such expenditures next year.

If the American bicycle industry, for the first time in a century, is pinning its rosy expectations on an unlimited adult market instead of a static youth one, the supporting evidence comes from:

¶Physical fitness consciousness. Fifteen years ago, Dr.

Paul Dudley White, President Eisenhower's physician, endorsed the bicycle as a weapon against heart attacks. His message lingered. "Dr. White did more for bicycles than any man living or dead," Mr. Caparros said reverently.

¶The newer ecology interest. The bicycle, as the president of the Columbia Manufacturing Company has pointed out, is the only form of transportation — including the horse — that doesn't pollute.

¶Encouragement for bicycle riding from municipal, state and Federal Government programs. The Bicycle Institute of America says that 6,300 miles of bicycle paths have been laid out in 200 cities. The institute has

pushed for legislation such as a law recently enacted in Oregon that permits revenues to be set aside from gasoline and road use revenues for bicycle paths. Representative Edward Koch, Democrat of New York, has introduced a bill that would permit states to use Federal highway money for paths.

¶Trend-setters like Jacqueline Onassis and Mayor John V. Lindsay of New York help the fashion-status of cycling while bicycle championships and races such as the eight-day Tour of California also kindle consumer interest.

But none of these factors is as pertinent as the newer

Continued on Page 4

Source: Santa Barbara Bike Plan 1974

CITY OF DAVIS
UNIVERSITY OF CALIFORNIA

BICYCLE CIRCULATION AND SAFETY STUDY

August 31, 1972

DE LEUW, CATHER & COMPANY · ENGINEERS AND PLANNERS

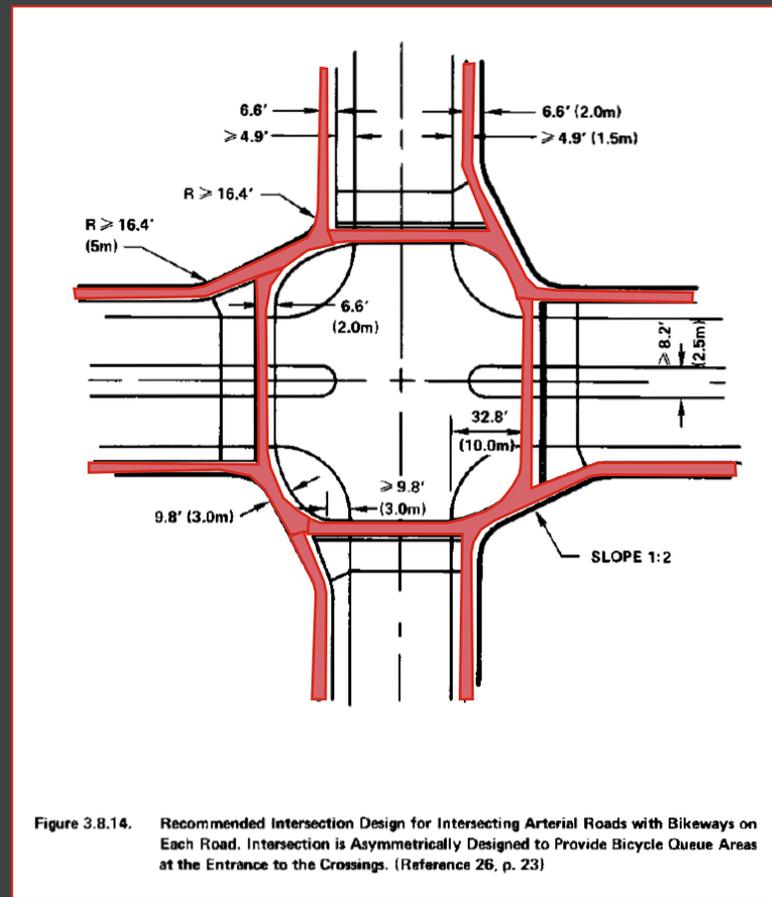
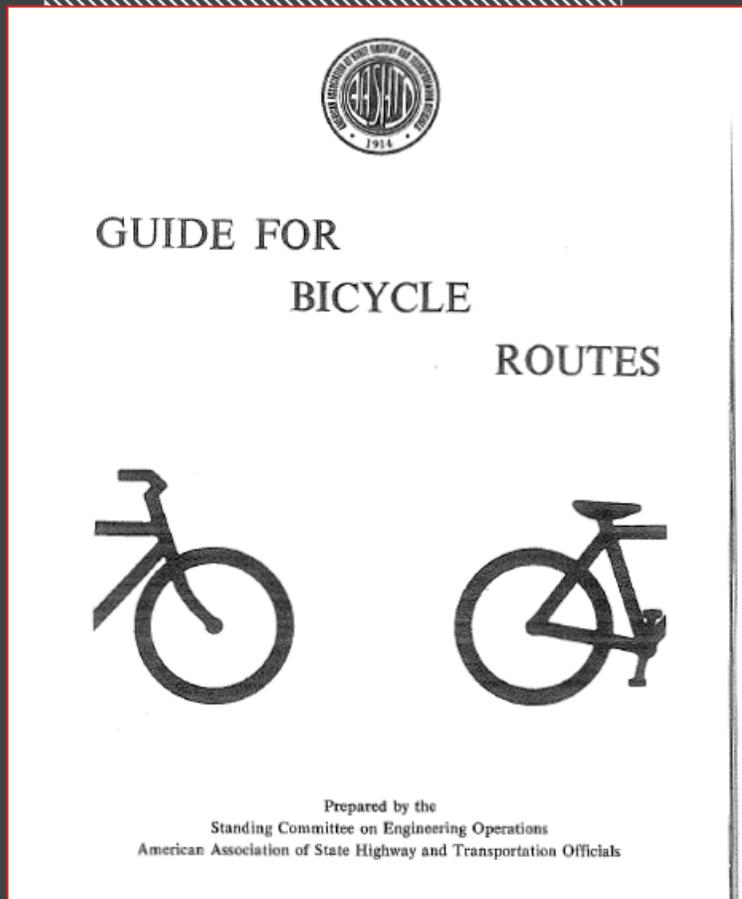
1972 DeLeuw Cather Research

Findings from Davis, CA were consistent with modern-day research on bicyclists' preferences and safety:

- Bicyclists & motorists prefer separation
- Bike lanes safer than shared lanes
- **Contra-flow bicycling increased crashes**
- Bicyclists operated at speeds of 7 -15 mph averaging 10 -11 mph
- Motorists would sometimes park or stop in unprotected bike lanes



1974 AASHTO Bike Guide



1974 AASHTO Bike Guide

Intersections and Crossings

Because the number and severity of conflicts between motorists, bicyclists, and pedestrians are greatest at intersections and crossings, utmost care must be taken in designing intersection which are to accommodate bicycle traffic. The safest and most effective way of eliminating conflicts where a bicycle route crosses another roadway is to provide a grade separation. This may be feasible in some cases, as discussed under grade separation structures. However, a grade separation usually cannot be provided because of lack of available space, especially where bicycle lanes or shared roadways cross at or near existing at-grade street intersections. Even where space is available, there seldom is warrant for the high cost of the structure. Therefore, a design which utilizes existing at-grade street intersections usually must be provided.

Wherever a bicycle lane is carried across an at-grade street intersection, some form of channelization with specific routings for bicycles should be provided to minimize the number of possible conflict points between bicycles, motor vehicles, and pedestrians within the intersection. Such channelization would not normally be necessary when shared roadways intersect a cross street, except where bicycle and motor vehicle traffic is heavy, motor vehicle speeds are in excess of 30 mph, or where there is a heavy percentage of motor vehicles making right turns out of the shared roadway.

Channelization usually consists of some form of striping or marking which clearly delineates the path which bicycles must take in crossing the intersection. In most cases the crossing should be adjacent to—but striped separately from—the pedestrian crosswalk. Bicyclists who wish to turn left should be encouraged to cross the cross street first and then proceed to the left within a marked path provided for the second street. The undesirable effect of the conflict between right-turning motorists and straight-through bicyclists can be reduced to some extent by offsetting the bicycle crossing of the cross street away from the intersection.

Examples of channelization arrangements to accommodate bicyclists at intersections are illustrated in Figure 7. Figure 7(a) depicts a pair of bicycle lanes which are carried straight through the intersection. With this arrangement, the bicycle route is a part of the street, directly aligned with the bicycle lane both upstream and downstream. The arrangement in Figure 7(b) likewise carries the bicycle lane through the intersection but the bicycle crossing is offset from the

1) Don't drop bike lanes at intersections

2) Mark bike crossing

3) mark 2-stage queue box

4) use protected intersection design to mitigate "right hooks"

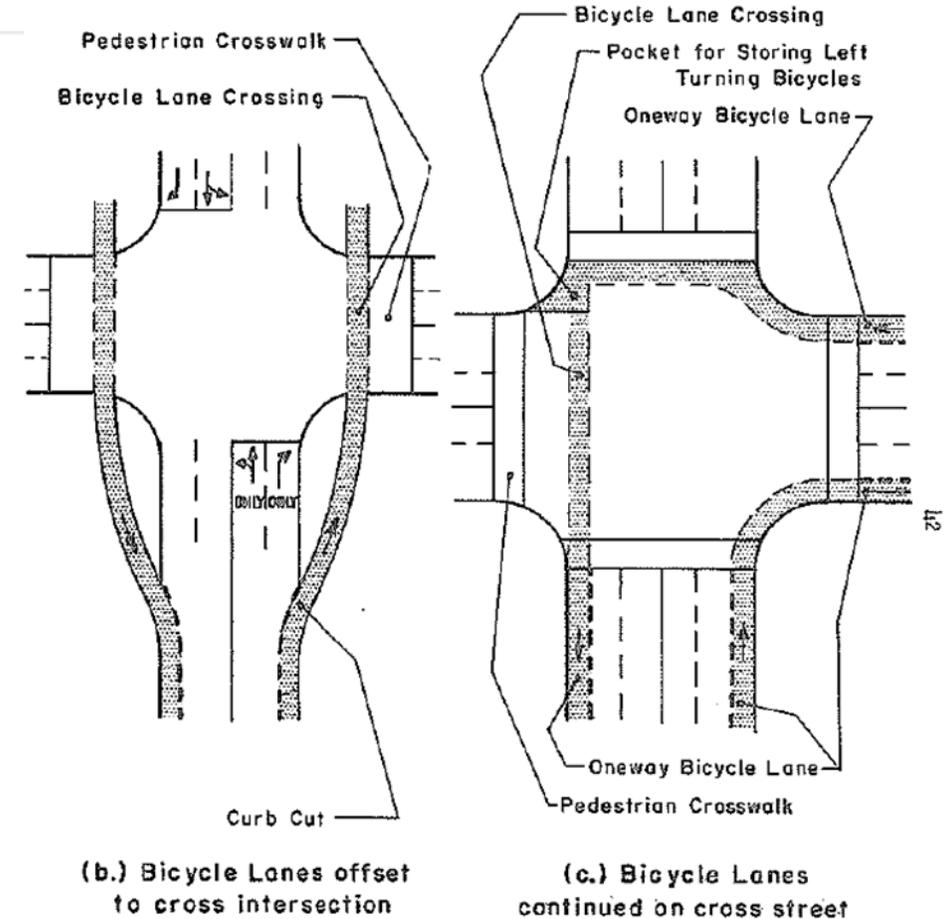


Figure 7
Bicycle Channelization Arrangements
At Street Intersections

1974 AASHTO Bike Guide

Bike lane warrants for commuter, recreational, or neighborhood bicyclists:

- 1) motor vehicle volume > 2,000 ADT,
- 2) bicycle volume > 200 bikes/day, and
- 3) motor vehicle speed > 30 mph.



Image: [Bicycling Safely on the Road \(Video\)](#)



Image: [Chicago Tribune](#)

1974 AASHTO Bike Guide

Table 3. Bikeway Surface Widths

Number of lanes	Minimum width, feet	Desirable width, feet
1	3.5	4.0
2	7.0	8.0
3	10.5	12.5
4	14.0	17.0



Seattle, WA 1977 Image Dongho Chang



DESIGN Davis, CA

1978/1979



Davis, CA

1978/1979

1970s Bicyclist Concerns



1:42 / 25:06



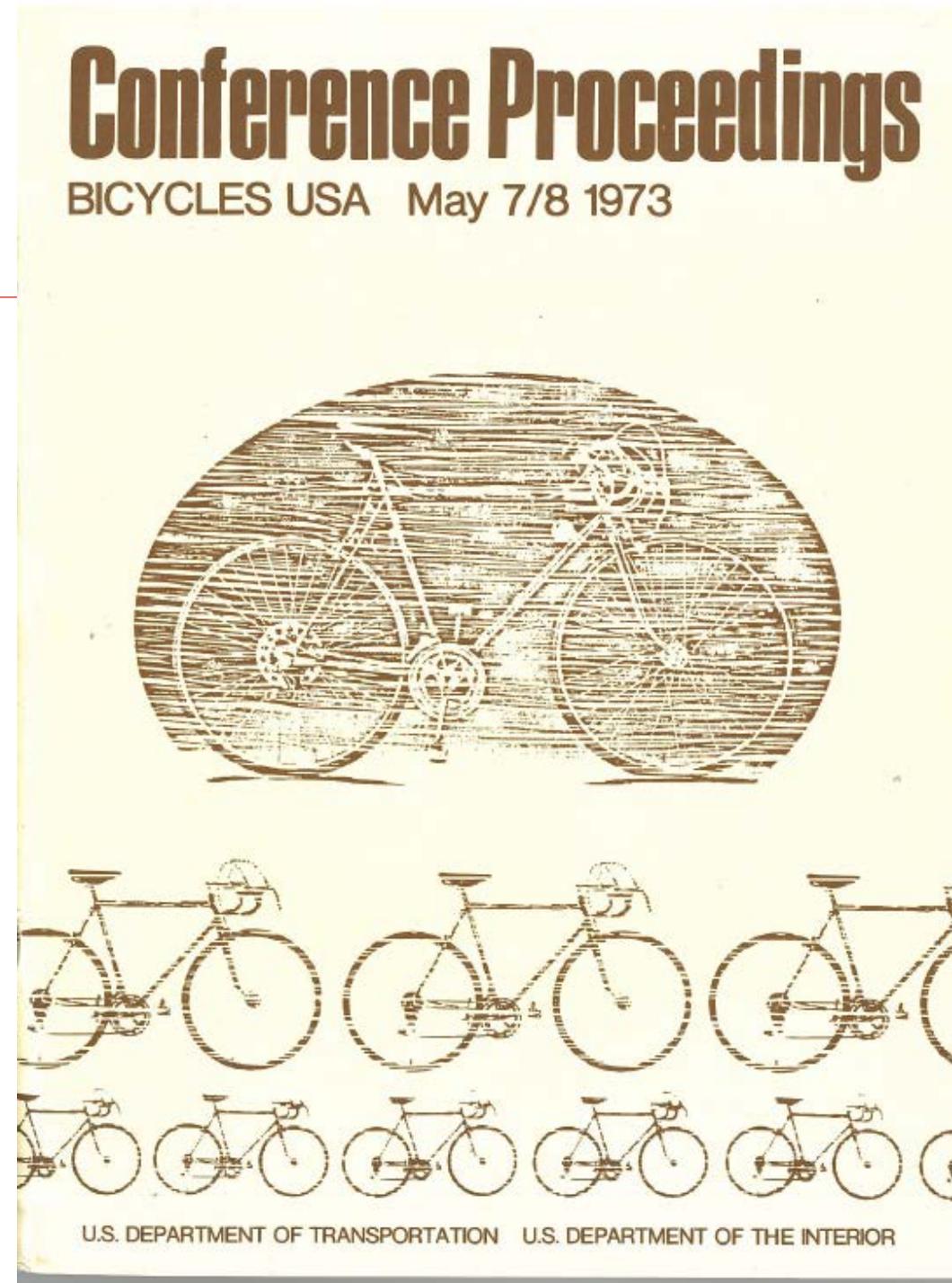
2:53 / 25:06

- Mandatory use laws
- Sidewalk routes
- Narrow paths
- Poor maintenance
- Losing “right to the road”

Bicycles USA 1973 Conference

“Should bikeways be designed to accommodate a **smaller number of people moving at the maximum rate of speed** achievable by the bicyclist **over long distances** or should they be designed to **accommodate the maximum number of people** willing to travel for **shorter trips**?”

- USDOT Assistant Secretary John Hilten



John Forester – Amateur Cycling Racer

“About 1970, California government decided to "make cycling safe" by establishing a system of laws and facilities that would impose the childish cyclist-inferiority system of operation upon all cyclists.”

- J. Forester



**When you're serious about cycling,
your bike shouldn't be a toy.**

Years ago a bicycle was just something you bought for the kids. But today cycling is a sport the whole family enjoys. So if you're serious about it, get the bike preferred by professional racers the world over. Peugeot certainly isn't a toy. But it's just as much fun. **PEUGEOT**
SPORT BIKES



John Forester – Amateur Cycling Racer

“Many people, including cyclists, told me that I had greatly exaggerated the dangers produced by these bikeways.

I rode the Middlefield sidewalk at the same speed that I had been using on the roadway.”

- J. Forester



Middlefield Road, 2017

1975 Effective Cycling

“Fortunately there is a safer way to bicycle than this. It is to move with cars, as a vehicle, riding accordance to traffic law. **Any other method of riding is dangerous.**”

- Effective Cycling

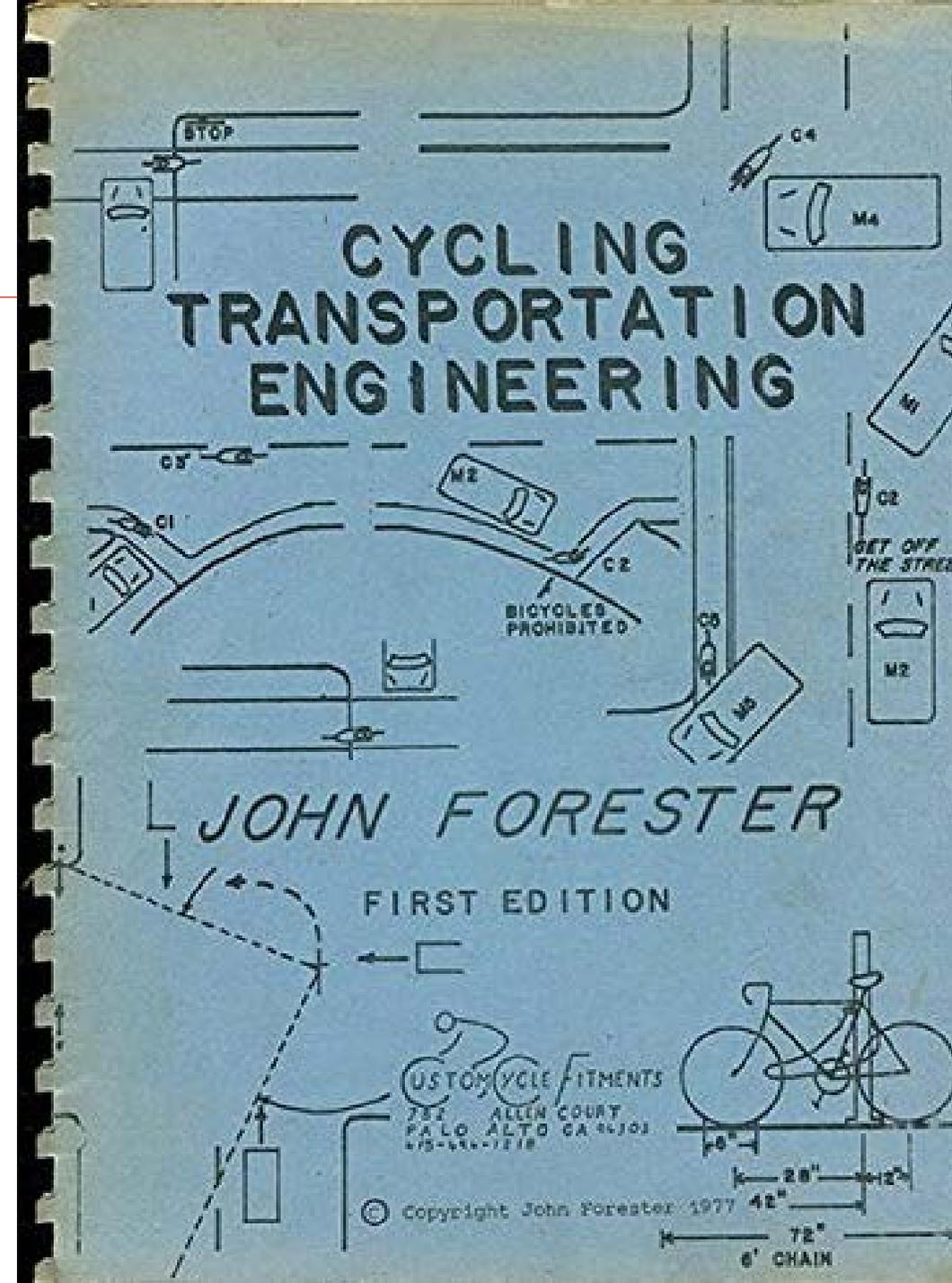


“Vehicular cycling...is faster and more enjoyable,
so that **the plain joy of cycling overrides the
annoyance of even heavy traffic.**” - john forester



1977 Cycling Transportation Engineering

“every facility for promoting cycling should be designed for 30 mph. If it is not, it will not attract the serious cyclist...and hence it will not be an effective part of the transportation system.”



1977 Cycling Transportation Engineering



Photo: Rotterdam – 25% Bicycle Mode Share

“A facility that is designed only for childlike and incompetent cyclists encourages the toy bicycle attitude and discourages cycling transportation.”

- J. Forester

Advocacy Cooperation?

Sommer Proposal is to Jointly Advocate for:

- Networks of bike lanes and paths for people concerned about traffic safety
- Right of experienced and confident cyclists to operate on the roadway with traffic

Building Bridges Between Communities of Cyclists

Bicycling, August 1977

by Robert Sommer

Recently I received a call from the legislative aide of a state senator asking my assistance on a bicycle bill. Their office was concerned that representatives of organized cyclists seemed opposed to a proposal to convert abandoned railroad rights-of-way to bicycle trails. The organized cyclists were claiming that special bicycle paths are unnecessary.

To someone unaware of the history of the bicycle movement, it would seem improbable that any group of cyclists would oppose a bill to encourage recreational riding facilities. The explanation is that the spokespeople

Advocacy Cooperation? - NO

The distinction between “proficient” and “casual” cyclists is really one between “active” and “hypothetical” cyclists.

The hypotheticals “are fond of saying that they don’t ride more because of the risk of riding in traffic, for whose reduction a comprehensive network of segregated paths is needed.

- John Finley Scott

*The Cycling Community:
Who Leads, Who
Follows? A Reply to
Bob Sommer*

Bicycling, November 1977

by John Finley Scott

In the August 1977 *Bicycling!* Bob Sommer argues that organized “expert cyclists” do not always represent the interests of casual riders, that each group should respect the other, that more research is needed on bicycle use. Who can disagree? But the more specific issues he raises are not so simple. Since I was the “representative of organized cyclists” he criticizes in his article and since we both work (and ride) in Davis, California, let me complicate matters with additional facts.

Sommer opens his article by reporting how I opposed legislation to acquire an old railroad right-of-way in nearby Solano County for use as a bike path. He explains the seeming paradox—a cyclist opposing a bike path—as a conflict of interest between proficient and casual cyclists: experts prefer to ride on



“But paths do not reduce these risks but only reduce the cyclists' largely irrational fear of overtaking vehicles.”
- J. Finley Scott

Low stress cycling = joyful cycling = social cycling

1974 Pessimism

In a 1974 ASCE paper, CalTrans engineer Harold Munn argued that **efforts to separate bicycles from the normal flow of vehicular traffic were not practical** in the 20th century, where the priority was to accommodate motorized vehicular traffic.

He concluded that “the bicyclist will have no choice but to mix with motorized traffic,” and that **it will be necessary to convince adult cyclists “to operate their bicycles as they do vehicles”**

1978 Caltrans Bike Guide

State of California, Traffic Manual, Business and Transportation Agency, Department of Transportation, Sacramento, April, 1977.

★ Munn, Harold E., Bicycles and Traffic, Transportation Engineering Journal, ASCE, Vol. 101, No. TE4, Proc. Paper 11729, pp 753-762, November 1975.

Guide for Bicycle Routes, American Association of State Highway and Transportation Officials, 1974.

Traffic Controls for Bicycle Facilities - Part IX of the Manual on Uniform Traffic Control Devices, Federal Highway Administration, Washington, D.C., March 25, 1977.

Smith, Daniel T., Jr., De Leuw, Cather & Company, Safety and Location Criteria for Bicycle Facilities, FHWA-RD-75-112, prepared for Federal Highway Administration, Offices of Research & Development, Washington, D.C. 20590, February, 1977.

Lott, Dale F., Lott, Donna, Y. and Harrington, Tammie M., Bikeway Usage and Design, Bicycle Research Associates, Davis, CA, 1975.

★ Forester, John, Cycling Traffic Engineering Handbook, Custom Cycle Fitments, Palo Alto, CA. 1977

TOOLE
DESIGN

Research Information and Publications Center
UNIVERSITY OF MICHIGAN
TRANSPORTATION RESEARCH INSTITUTE

Planning and Design Criteria for Bikeways in California

Pursuant to: Sections 2373, 2374,
2375, and 2376 of the
Streets and Highways Code

Highway Safety
Research Institute

APPROVED:

Adriana Gianturco
ADRIANA GIANTURCO
Director of Transportation

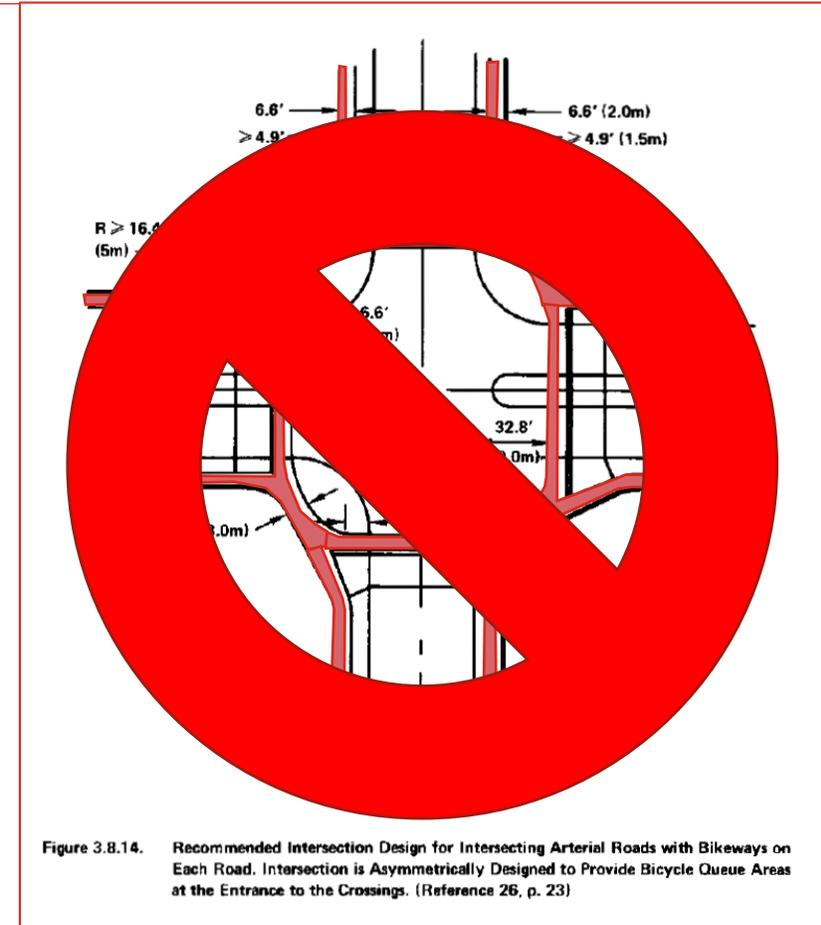
DATE: June 30, 1978

State of California
Business and Transportation Agency
Department of Transportation



1981 AASHTO Bike Guide

“Mr. Forester provided over half the comments.” – Richard Lemieux FHWA Author of 1981 Guide



Protected Bike Lanes & Intersections

1981 AASHTO Bike Guide



Assertive Cycling

Taking Your Place on the Road

John S. Allen

My favorite time of the year to take to the road is the summer, when all points to the north and south lead toward the Massachusetts shoreline, and routes to the west head to the mountains. Cycling on these rural roads and highways requires some thought on my part, however, since it's a far cry from my everyday cycle-commute through downtown Boston.

Over the years, I've found the best way to handle unfamiliar or heavily traversed terrain is by drawing on both my common sense and knowledge of traffic laws. It's entirely possible to share the road with all types of vehicles. Just remember one rule: use courtesy when you can, and be assertive if you must. Then you can take to the road with confidence.

Coping With Traffic

“Many of the common problems are related to improper bicyclist and motorist behavior and **can only be corrected through effective education and enforcement programs**”

- AASHTO Introduction

July 1982 *Bicycling Magazine*



Federal Policy de-emphasized Bicycling - 1980's Wide Lanes = Ideal Design

The 1%...

The typical cyclist became the
“Spandex Road Warrior”

Image: Fairfax Times



The rest of this presentation
could not be shared because it
contains materials from the Draft
AASHTO Bike Guide

Please let us know if you have questions

[Bill Schultheiss](#), PE

[Jeremy Chrzan](#), PE, PTOE, LEED AP