National Association of City Transportation Officials (NACTO)
Cities for Cycling
Evolution of the NACTO Guide
Insufficient and Inadequate Design Guidance for Cities
4 Problems

With Existing Design Guidance For Bicycle Facilities In the United States
1. Insufficient Design Guidance
2. Lack of Guidance for Urban Environments
3. Inadequate Composition
4. Cumbersome Review Process
INTERNATIONAL
BEST PRACTICES
State of the Practice
Benefits

NOT JUST COPENHAGEN
International Best Practices
Enough Excuses!
Seville
Innovation in US Cities
Innovation in cities across the US
Portland, OR
Philadelphia, PA
Madison, WI
Existing Design Manuals vs. Best Practices
NACTO Urban Bikeway Design Guide
City DOTs

Atlanta

Detroit

Minneapolis

Portland

Austin

Chicago

New York

San Francisco

Baltimore

Houston

Philadelphia

Seattle

Boston

Los Angeles

Phoenix

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Sponsors

- Bikes Belong
- SRAM Cycling Fund
Expanding the Design Toolbox

21 Treatments
5 Categories
Online Guide & Slideshow

One-Way Protected Cycle Tracks

Urban Bikeway Design Guide
- Bike Lanes
- Cycle Tracks
  - One-Way Protected Cycle Tracks
  - Raised Cycle Tracks
  - Two-Way Cycle Tracks
- Intersections
- Signals
- Signing & Marking
- City Projects
- Master Reference Matrix
Raised Cycle Tracks

Raised cycle tracks are bicycle facilities that are vertically separated from motor vehicle traffic. Many are paired with a furnishing zone between the cycle track and motor vehicle travel lane and/or pedestrian area. A raised cycle track may allow for one-way or two-way travel by bicyclists. Two-way cycle tracks have some different operational characteristics that merit additional consideration.

Raised cycle tracks may be at the level of the adjacent sidewalk, or set at an intermediate level between the sidewalk and pedestrian area. A raised cycle track may be combined with a parking lane or other barrier between the cycle track and the motor vehicle travel lane (paved with protected cycle tracks for additional guidance). At intersections, the raised cycle track can be dropped and merged into the street (see cycle track installation approach), or it can be maintained at sidewalk level, where bicyclists cross with pedestrians, possibly with a dedicated bicycle signal.

When placed adjacent to a travel lane, one-way raised cycle tracks may be configured with a maneuverable curb to allow entry and exit from the travel lane for passing other objects in the access vehicle travel lane. This configuration has also been known as a ‘raised bike lane.’
IN THIS SECTION:
- One-Way Protected Cycle Tracks
- Raised Cycle Tracks
- Two-Way Cycle Tracks

CYCLE TRACKS

A cycle track is an exclusive bike facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane.

A cycle track is physically separated from motor traffic and distinct from the sidewalk. Cycle tracks have different forms but all share common elements—providing space that is intended to be exclusively or primarily used for bicycles, and are separated from motor vehicle travel lanes, parking lanes, and sidewalks. In situations where on-street parking is allowed, cycle tracks are located in the curb-side of the parking (in contrast to bike lanes).

Cycle tracks may be one-way or two-way, and may be at street level, at sidewalk level, or at an intermediate level. If at sidewalk level, a curb or median separates them from motor traffic, while different pavement color/texture separates the cycle track from the sidewalk. If at street level, they can be separated from motor traffic by raised medians, on-street parking, or bollards. By separating cyclists from motor traffic, cycle tracks can offer a higher level of security than bike lanes and are attractive to a wider spectrum of the public.
One-Way Protected Cycle Tracks

This treatment covers one-way cycle tracks that are at street level and use a variety of methods for physical protection from passing traffic. See raised cycle track for information on alternative cycle track designs. Street level cycle tracks are also known as “on-street bike paths” in New York City.
Compared with bicycling on a reference street...these cycle tracks had a 28% lower injury rate.”


- Reduces risk of “dooring” compared to a bike lane and eliminates the risk of a doored bicyclist being run over by a motor vehicle.

- The construction of [raised] cycle tracks has resulted in a slight drop in the total number of accidents and injuries on the road sections between junctions of 10% and 4% respectively.


- Prevents double-parking, unlike a bike lane.

- Streets for which conflicts at intersections can be effectively mitigated using parking lane setbacks, bicycle markings through the intersection, and other signalized intersection treatments.

- Along streets with high bicycle volumes.

- Along streets with high motor vehicle volumes and/or speeds.

- Special consideration should be given at transit stops to manage bicycle & pedestrian interactions.
Cycle tracks may be shifted more closely to the travel lanes on minor intersections to put cyclists clearly in the field of view of motorists.

It is recommended that on roads within built-up areas ... cycle tracks are bent in 20-30 meters before and intersecting road (bending in is defined as bending a separate cycle track toward the carriageway, with the distance between the cycle track and the side of the main carriageway measuring between 0 and 2 m).

- Function of Bending Cycle Track
  - Improving conspicuity of cyclists

A BIKE LANE sign (MUTCD R3-17) may be used to designate the portion of the street for preferential use by bicyclists. A supplemental “No Cars” selective exclusion sign may be added for further clarification.

The ONLY word marking (see MUTCD Figure 3B-2B) may be used ... to supplement a preferential lane word or symbol marking.

Sections

Treatment Adoption and Professional Consensus

- Commonly used in dozens of European bicycle friendly cities.
- Currently used in the following US cities:
  - Boulder, CO
  - Cambridge, MA
  - Missoula, MT
  - New York, NY
  - Portland, OR
  - San Francisco, CA
  - St. Petersburg, FL
  - Washington, DC
9th Avenue On-street Protected Bike Path  New York City

In the fall of 2007, the New York City Department of Transportation built the first on-street parking and signal protected bicycle facility in the United States on Ninth Avenue between 23rd Street and 16th Street in Manhattan. Ninth Avenue is a 25-milearter street.

In 2007, NYC DOT multimodal at every stage with all stakeholders from early on in the project and included a variety of specialists and city departments in the design process. Parking regulations were modified several times following the installation of the facility to meet the needs of residents, business owners, and customers.
Technical Guidance

A cycle track, like a bike lane, is a type of preferential lane as defined by the MUTCD.

Three feet is the desired width for a parking buffer to allow for passenger loading and to prevent door collisions.

If pavement markings are used to separate motor vehicle parking lanes from the preferential bicycle lane, solid white lane line markings shall be used. Diagonal crosshatch markings may be placed in the neutral area for special emphasis. See MUTCD Section 3R.24. Raised medians or other barriers can also provide physical separation to the cycle track.

A BIKE LANE sign (MUTCD R3-17) may be used to designate the portion of the street for preferential use by bicyclists. A supplemental "No Cars" selective exclusion sign may be added for further clarification.

Sidewalk curbs and furnishings should be used to prevent pedestrian use of the cycle zone. Gutter seams, drainage inlets, and utility covers should be configured so as not to impede bicycle travel and to facilitate run-off.

Cycle tracks may be shifted more closely to the travel lanes on minor intersection approaches to put bicyclists clearly in the field of view of motorists. (Not shown.)

When using a pavement marking buffer, desired parking lane and buffer combined width is 11 feet to discourage motor vehicle encroachment into the cycle zone.

Bicycle lane word, symbol, and/or arrow markings (MUTCD Figure 9C-3) shall be placed at the beginning of a cycle track and at periodic intervals along the facility based on engineering judgment.

Colored pavement may be used to further define the bicycle space.
A cycle track, like a bike lane, is a type of preferential lane as defined by the MUTCD.

See MUTCD advice on diagonal striping Section 3B.24 05

4 in Normal white line
8 in Wide white line

If pavement markings are used to separate motor vehicle parking lanes from the preferential bicycle lane, solid white lane line markings shall be used. Diagonal crosshatch markings may be placed in the neutral area for special emphasis. See MUTCD Section 3B.24. Raised medians or other barriers can also provide physical separation to the cycle track.

A BIKE ONLY legend (MUTCD 3D.01) may be used to supplement the preferential lane word or symbol marking.

Colored pavement may be used to further define the bicycle space.

With high bicyclist volumes or uphill sections, the desired width should be 7 feet to allow for bicyclists passing each other.

Intersections approaches to put bicyclists clearly in the field of view of motorists. (Not Shown).

Gutter seams, drainage inlets, and utility covers should be configured so as not to impede bicycle travel and to facilitate run-off.

Street for preferential use by bicyclists. A supplemental “No Cars” selective exclusion sign may be added for further clarification.

Pedestrian use of the cycle zone.
Cycle Track
5-7 foot minimum

The desired wide track should be with high bicyclist uphill sections, it should be 7 feet for bicyclists passing.

Colored pavement may be used to further define the bicycle space.
Treatments
BIKE LANES
BIKE LANES

Conventional Bike Lanes

Buffered Bike Lanes

Contra-Flow Bike Lanes

Left-side Bike Lanes
CYCLE TRACKS
CYCLE TRACKS

One-Way Protected Cycle Tracks

Raised Cycle Tracks

Two-way Cycle Tracks
INTERSECTIONS
SIGNALS
Signals

Bicycle Signal Heads

Signal Detection and Actuation

Hybrid Signal for Bike Route Crossing of a Major Street

Active Warning Beacon for Bike Route at Unsignalized Intersection
SIGNING & MARKING
Signing and Marking

Colored Bicycle Facilities

Shared Lane Markings

Bike Route Wayfinding Signage and Marking System
The Next Steps:
Adoption and Implementation
NACTO Coverage
MUTCD
Approval
Bicycle Master Plan

City of Pasadena
Map 6.2: DRAFT Existing and Proposed Bikeways

Legend
*Requires further planning and coordination with other agencies
Existing Bikeways
- Class II - Bike Lanes
- Class III - Bike Routes
- Class III - Enhanced Bike Routes
Proposed Bikeways
- Class I - Proposed Bike Paths*
- Class II - Proposed Bike Lanes
- Class II - Proposed Bike Lanes and Emphasized Bikeways
- Class III - Proposed Bike Routes
- Class III - Proposed Enhanced Bike Routes
- Proposed Emphasized Bikeways
- Proposed Multi-Purpose Paths*
Complete Streets
Cities and the Guide
Cities and the Guide
Bike Share
Safety in Numbers

Bicycle Ridership and Casualties, NYC

Annual Casualties
(Injuries and Fatalities)
Safety in Numbers

Combined Bicycle Traffic over Four Main Portland Bicycle Bridges Juxtaposed with Bicycle Crashes

- Cyclists per Day
- Crashes and Indexed Crash Rate

- Bridge Bicycle Traffic
- Reported Bicycle Crashes*
- Indexed Bicycle Crash Rate (Trend Line)

<table>
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Bicycle Fatalities:
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- 1992: 0
- 1993: 4
- 1994: 3
- 1995: 2
- 1996: 1
- 1997: 5
- 1998: 3
- 1999: 0
- 2000: 5
- 2001: 0
- 2002: 4
- 2003: 1
- 2004: 0
- 2005: 6
- 2006: 0
- 2007: 4
- 2008: 0
- 2009: 4
- 2010: *
Future Editions and Publications
### Cities that have Endorsed the NACTO Guide

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Thank You