NACTO
Urban Bikeway
Design Guide

State of the Practice Solutions

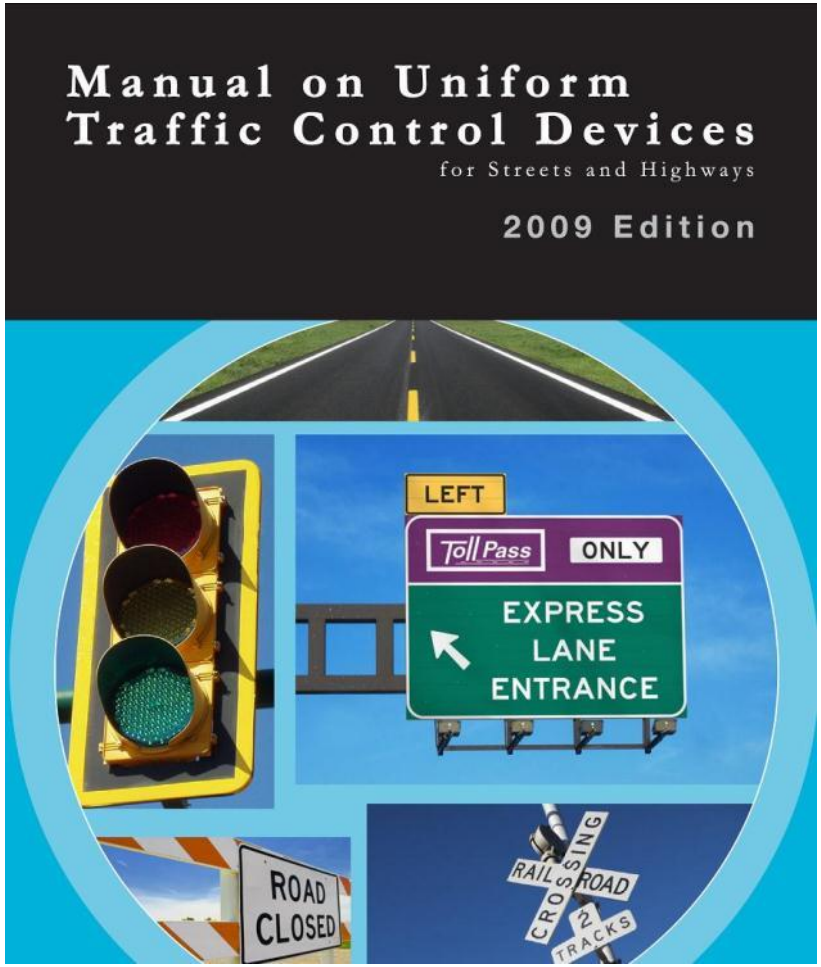
NACTO Urban Bikeway Design Guide

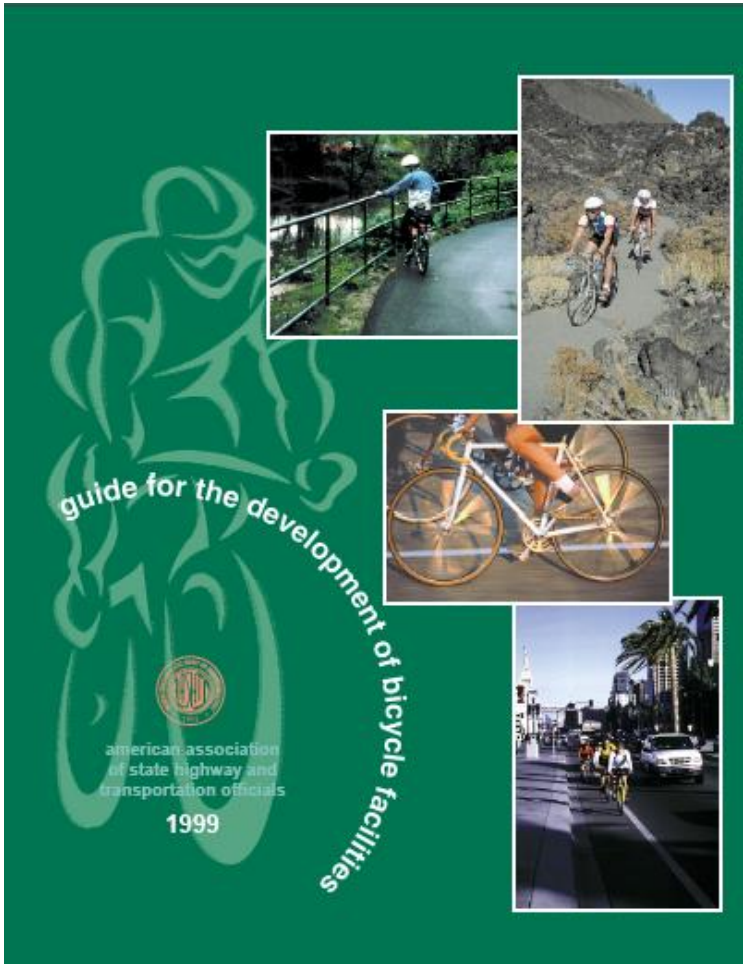
October 29, 2013

Winter 2009

NACTO Launches Cities for Cycling Project

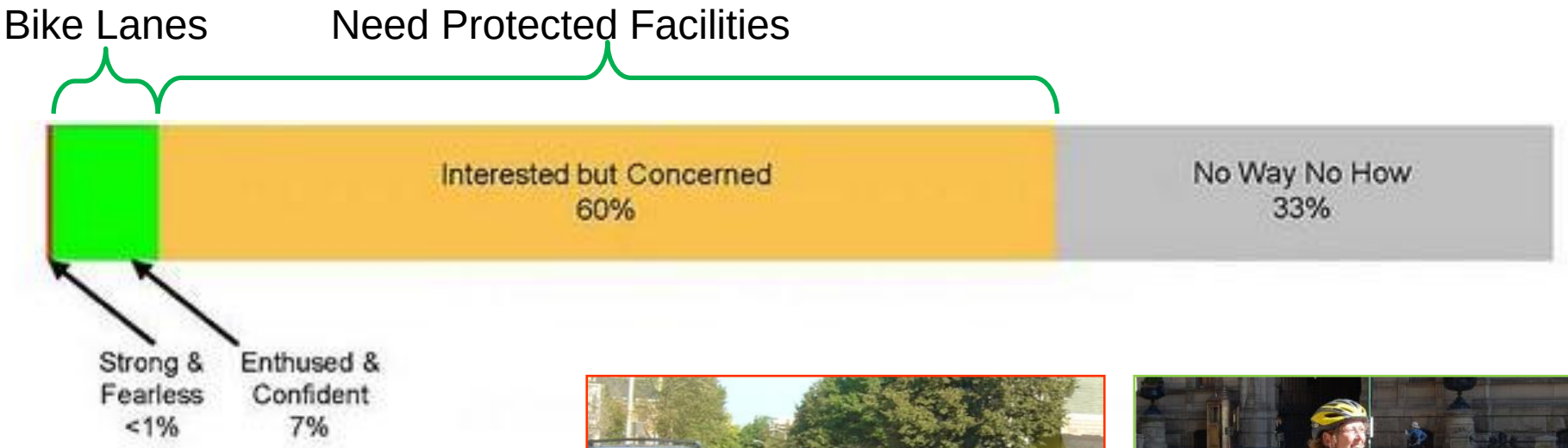
Bikeway Design Guidance in 2009



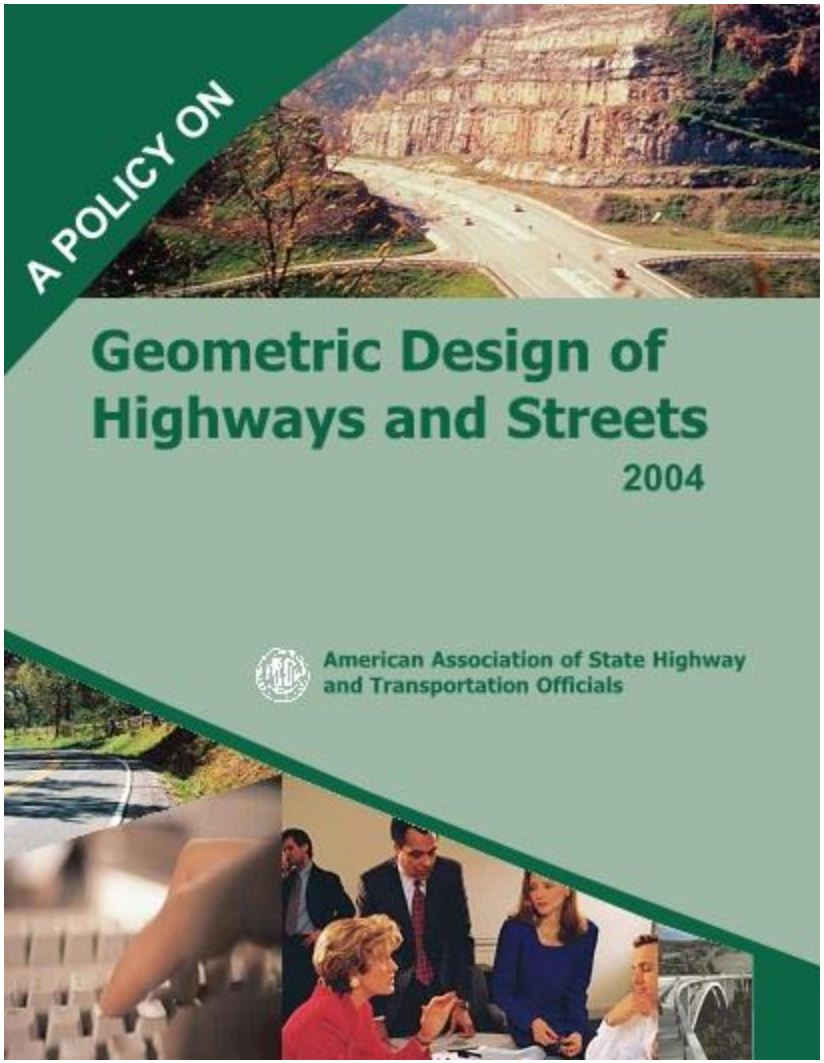


Four Types of Transportation Cyclists

By Proportion of Population



Credit: Roger Geller, City of Portland

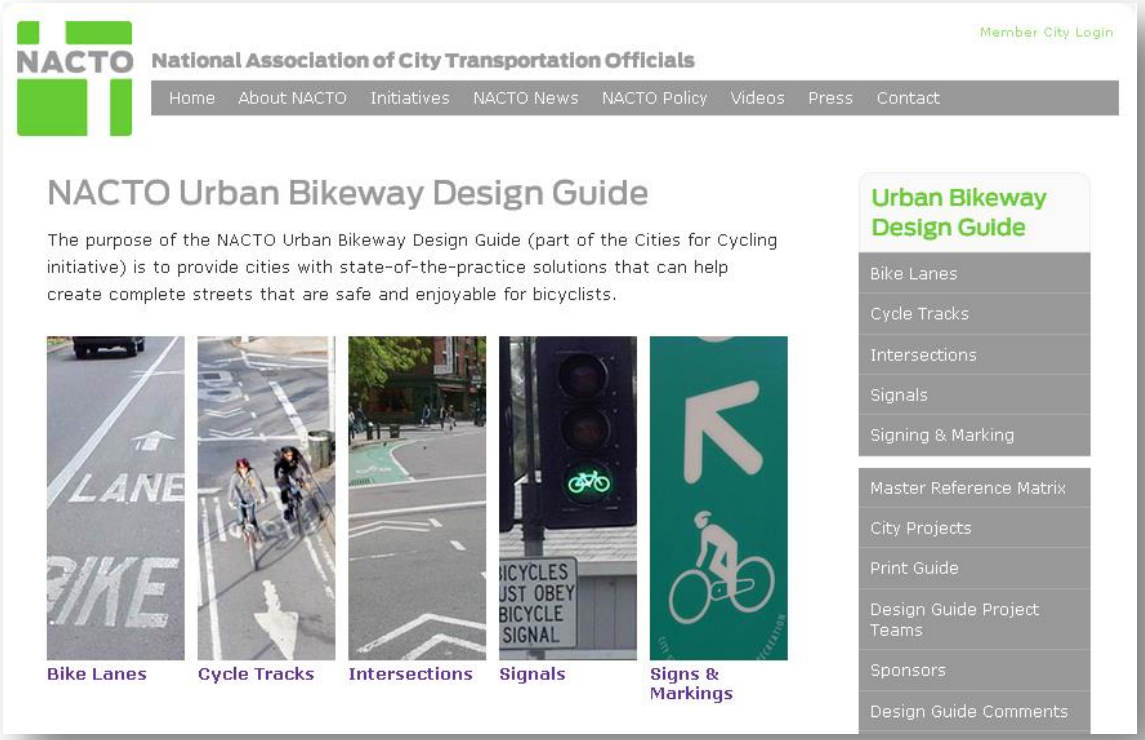


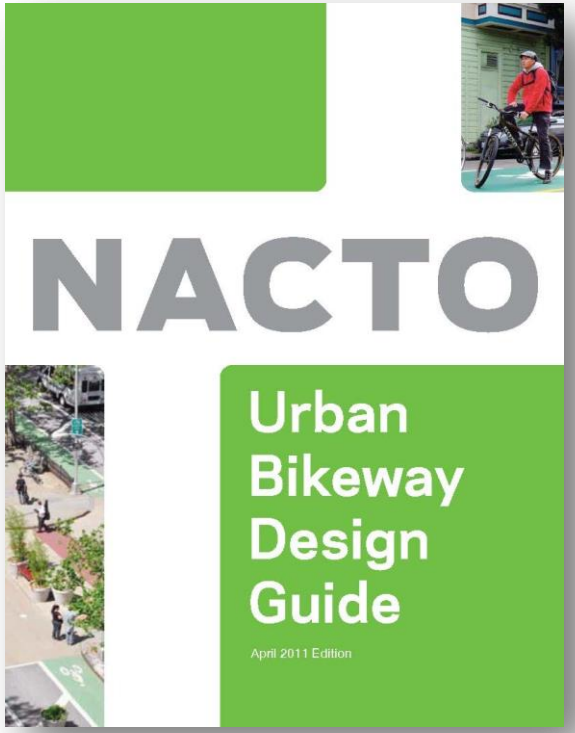
"The bicycle has become an important element for consideration in the highway design process. ***Fortunately, the existing street and highway system provides most of the mileage needed for bicycle travel."***

- *900 pages of guidance*
- *Less than 1 page on bicycles*

FHWA Status of Existing Bikeway Treatments

Description of Bicycle Facilities	Status in the FHWA's Manual on Uniform Traffic Control Devices (MUTCD)	Are FHWA Experiments in Progress?
Signs and Markings		
Bike Lanes		
Conventional bike lanes	Can be implemented at present time	
Continuation of bike lanes up to intersections	Can be implemented at present time	
Dashed bike lanes through intersections	Can be implemented at present time	
Use of green pavement markings for bike lanes and cycle tracks within intersections	Interim approval has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10	Yes
Green bike lanes at conflict points such as heavy turning and merging locations	Interim approval has been granted. Requests to use green colored pavement need to comply with the provisions of Paragraphs 14 through 22 of Section 1A.10	Yes





Spring 2011

First Online Edition and Free PDF Released

Professionals

Federal
State
Local

Direct Outreach
Webinars
Conferences

City Leaders

Policymakers

Endorsement Campaign

Advocates

State
Local
Bloggers

Direct Outreach

Using and adopting the NACTO Guide

Level of Government	Process
Federal	- Changes to MUTCD (Green Color, Bike Box, Bike Signal) - Secretary LaHood endorsement - Federal Policy statement
State	- Complete Streets Policy - Adoption through Reference - Legislative Action
Local	- Endorsement - Resolution - Ordinance - Administrative Action/Policy - Implementation - Complete streets

Official endorsements

Alexandria, VA
Ann Arbor, MI
Arlington, VA
Atlanta, GA
Austin, TX
Baltimore, MD
Boston, MA
Boulder, CO
Cambridge, MA
Charlotte, NC
Charleston, SC
Cheyenne, WY
Chicago, IL
Fargo, ND
Fort Collins, CO
Fort Wayne, IN
Hoboken, NJ
Indianapolis, IN
Los Angeles, CA
Manhattan, KS
Memphis, TN
Miami, FL
Minneapolis, MN
New York, NY
Norfolk, VA
Oakland, CA
Orlando, FL
Omaha, NE
Philadelphia, PA
Pittsburgh, PA
Phoenix, AZ
Portland, OR
Rochester, NY
Salt Lake City, UT
San Francisco, CA
Seattle, WA
Sioux Falls, SD
St. Petersburg, FL
Tacoma, WA
Trenton, NJ
Washington, DC

Fall 2011

Secretary LaHood Endorses NACTO Guide
Official Print Guide First Edition Released

Design Guidance

Two-Stage Turn Queue Box

Required Features

1. An area shall be designated to hold queuing bicyclists and formalize two-stage turn maneuvers.[71]
2. Pavement markings shall include a bicycle stencil and a turn arrow to clearly indicate proper bicycle direction and positioning.

SALT LAKE CITY, UT (PHOTO: SALT LAKE CITY PUBLIC WORKS)

VANCOUVER, CANADA (PHOTO: WILL VANLUE)

3. The queue box shall be placed in a protected area. Typically this is within an on-street parking lane or between the bicycle lane and the pedestrian crossing.
4. In cities that permit right turns on red signal indications, a "No Turn on Red" sign shall be installed overhead to prevent vehicles from entering the queuing area. (MUTCD Section 2B.54)

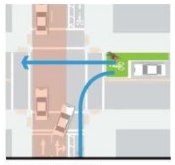
Recommended Features

5. In cases where a constrained roadway geometry or right of way prevents the creation of a dedicated two stage turn queue box in a protected location:
   - The pedestrian crosswalk may be adjusted or realigned to enable space for a queue box.
   - A bike box may be provided behind the pedestrian crossing to serve the same purpose. This configuration should only be considered if pedestrian volumes are low, as bicyclists must yield to pedestrians in the crosswalk before entering the queue.
6. The queue box should be positioned laterally in the cross-street, to promote visibility of bicyclists.
7. Colored paving inside of the queuing area should be used to further define the bicycle space.
8. Markings across intersections should be used to define through bicyclist positioning.

Cycle Track Buffer Configuration

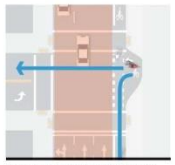
Parking Lane Configuration

Crosswalk Setback Configuration
Wider corner radii, set back pedestrian crossing, and/or narrowed bikeway space, provides opportunity for queue box.

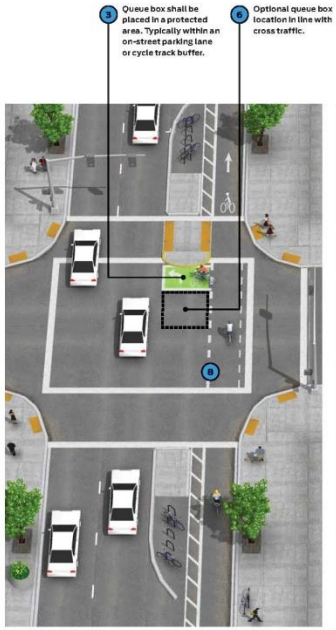


Bike Box Configuration
Bicyclists yield to pedestrians. Not recommended in areas with high pedestrian volumes.

T-Intersection Parking Lane Configuration



T-Intersection "Jughandle" Sidewalk Configuration



Optional Features

9. The queue box may be positioned laterally in the cross street parking lane rather than in front of the travel lane. This may require bicyclists to weave into the travel lane to resume through movement if no dedicated bicycle facility is present since the parking lane ahead will be occupied.
10. At midblock turning locations, the queue box may be integrated into the sidewalk space. This configuration is also known as a "jughandle." Consider the use of some form of signalization at these locations.
11. Signage may be used to define proper positioning and improve visibility of the queue box.
12. A bicycle signal, with leading bicycle interval, may be installed in conjunction with the two-stage turn queue box.[72]
13. Guide lines, pavement symbols, and/or colored pavement may be used to lead bicyclists into the queue box.

Design Guidance

Median Refuge Island

Required Features

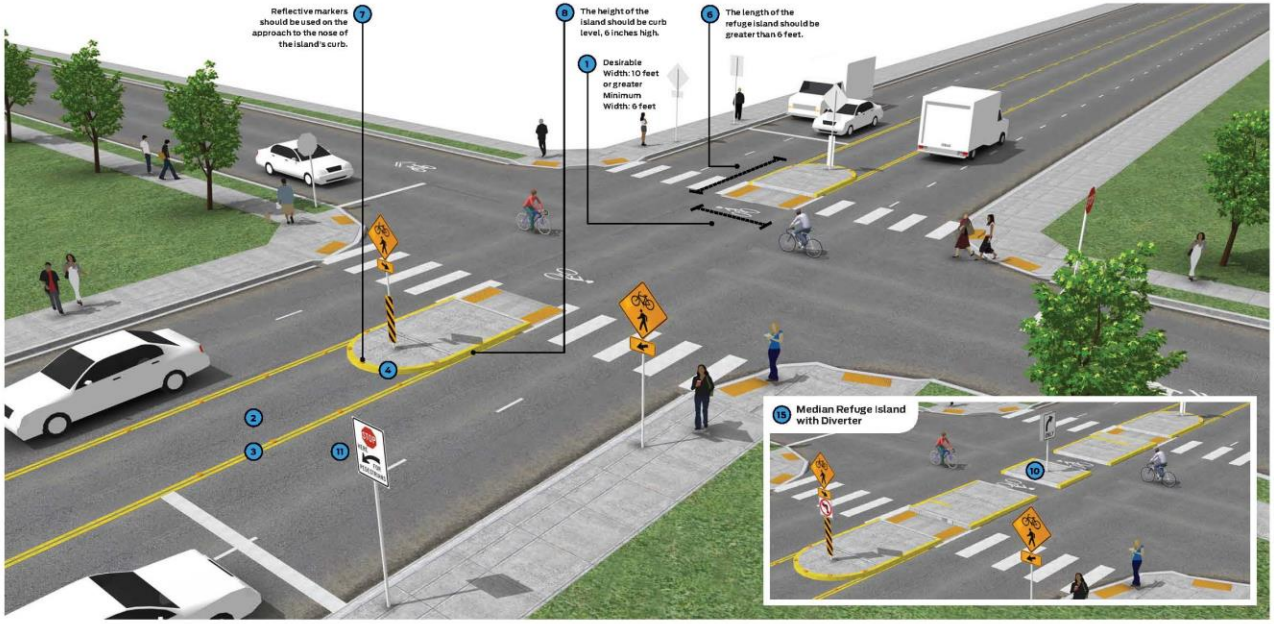
1. The desirable width of the median refuge is 10 feet or greater. The absolute minimum width is 6 feet.[73]
2. When applied on a two-way street, the median refuge shall be placed along the centerline of the roadway between the opposing directions of travel.
3. Pavement markings on the approach to the refuge island shall follow the guidance provided in Section 3I.02 of the MUTCD.[74]
4. The approach edge of the raised median shall be outlined in retroreflective white or yellow material.[75]
5. In areas with snow accumulation, reflective delineators shall be used to mark the island for increased visibility to snow plow crews.

Recommended Features

6. The length of the refuge island should be greater than 6 feet.[76]
7. Reflective markers should be used on the approach to the nose of the island's curb.[77]
8. The height of the island should be curb level, 6 inches high. When used as an exclusive bicycle facility it may be desirable to keep the refuge area at street level.[78]
9. An angled cut-through (45 degrees) should be provided to position bicyclists to face oncoming traffic. If the cut-through is to be shared with pedestrians, the 45-degree angle of the curb should transition back to being perpendicular to the street to provide proper directional cues for the blind.
10. The refuge area should be wide enough to accommodate two-way bicycle traffic.

Optional Features

11. "Advanced Stop" signs and markings for motorists may be included.[79]
12. Landscaping may be provided in the median, but it should not compromise visibility.[80]
13. Lighting may be installed for improving visibility of the facility at night.
14. At signalized intersections, push buttons or other detection methods may be provided to actuate the signal head.
15. The median refuge can be carried across the entire cross street approach to act as a diverter to prevent cut-through traffic on a bicycle route.

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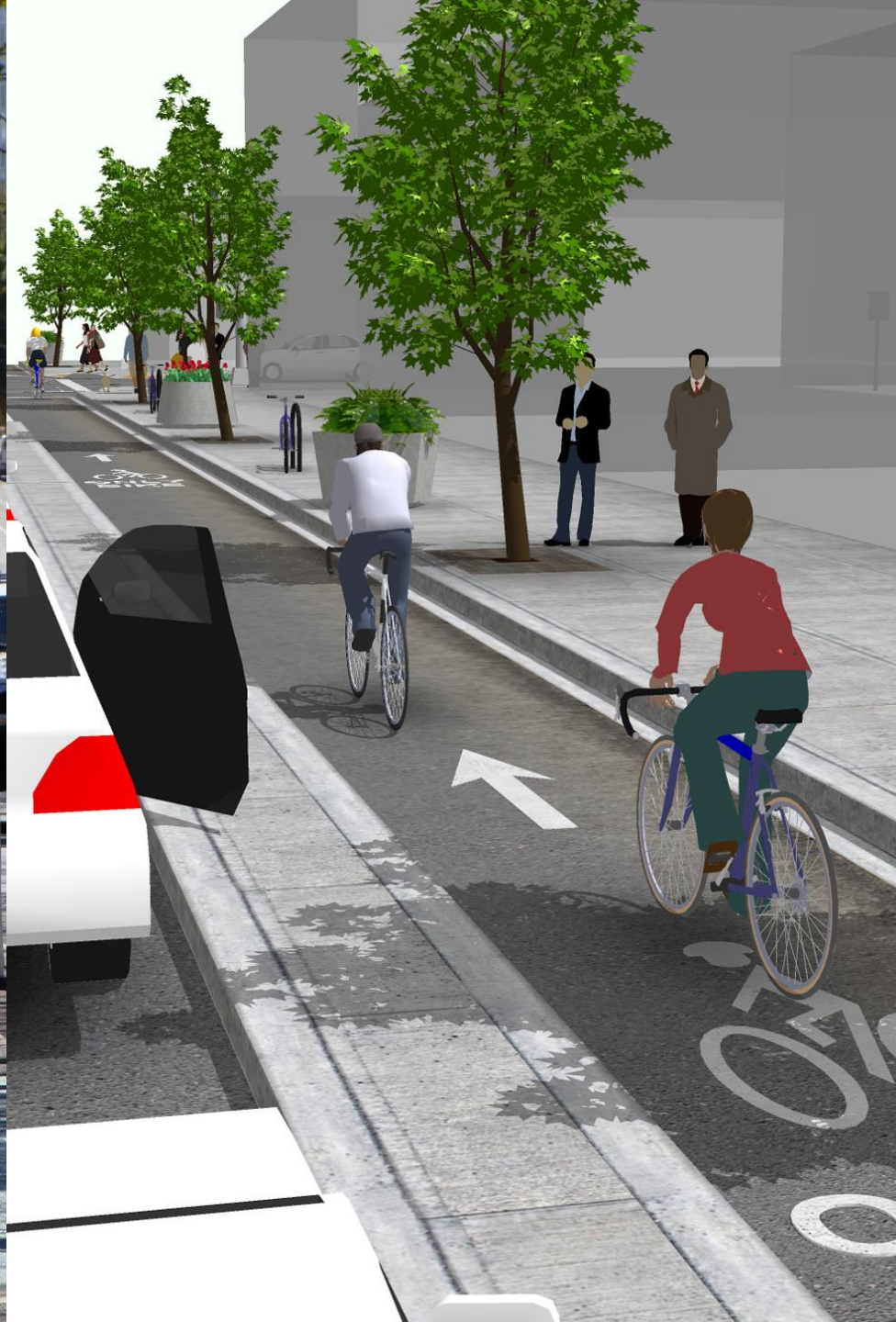



PLEASE
SLOW DOWN
CHILDREN
and PETS
CROSSING


WAIT HERE

2009-10
Boston
Philadelphia
Baltimore

2011
Chicago

2012
Atlanta
Memphis

2009-2012

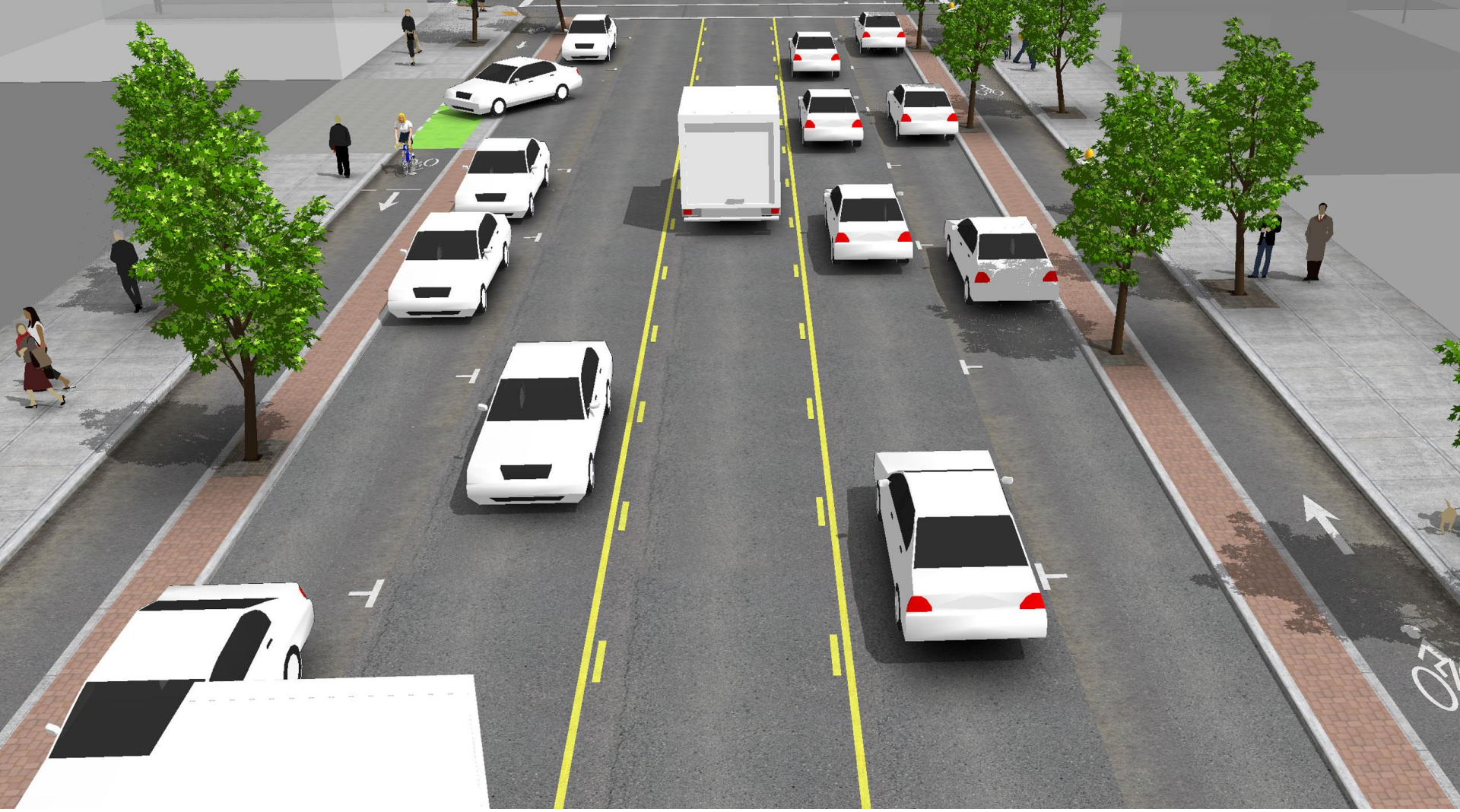
Cities for Cycling Road Shows

Types of Cycle Tracks and Intersection Design Strategies

One-way Protected Cycle Track

One-way Cycle Track

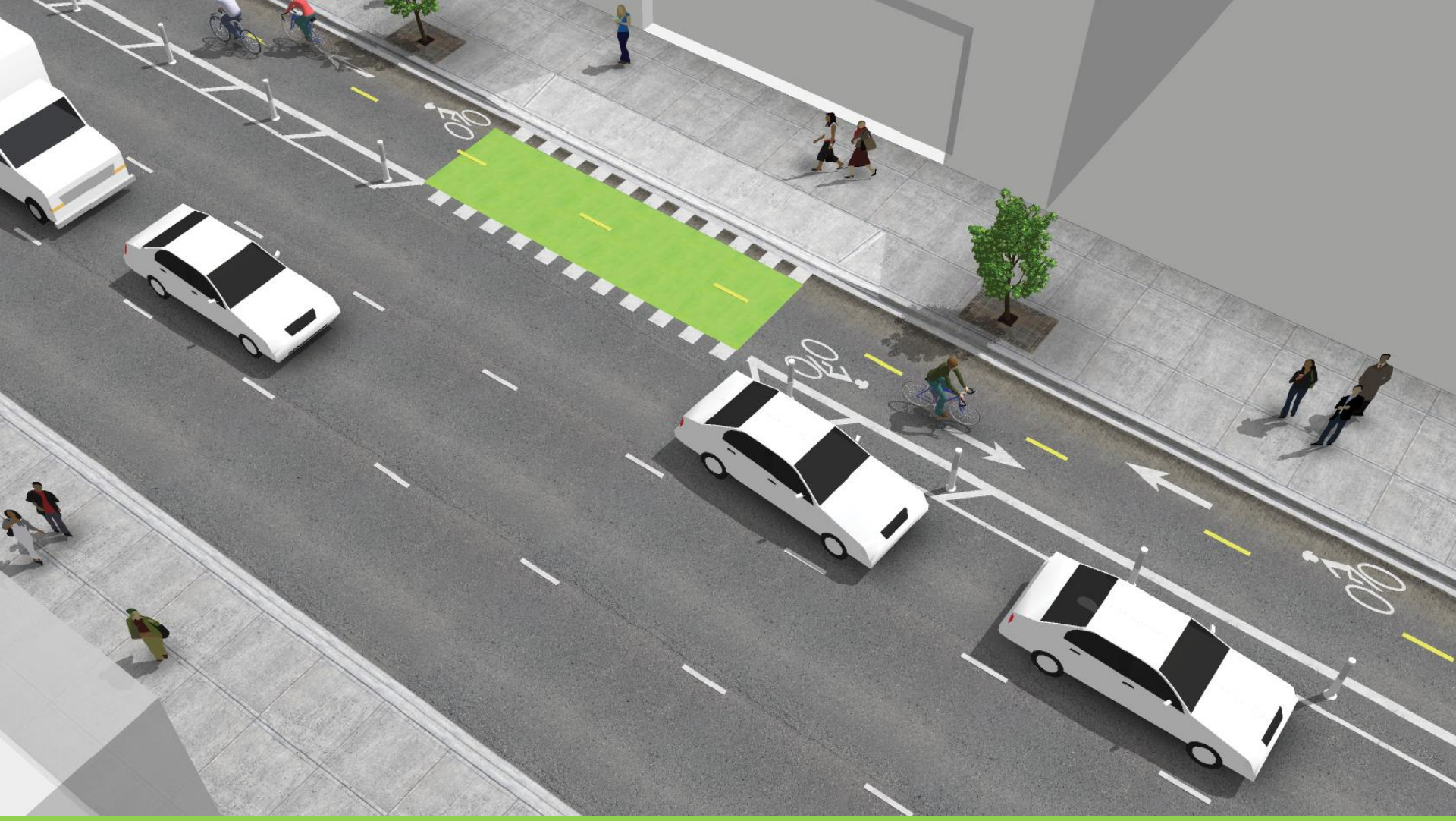
Austin, TX



Raised Cycle Track

Raised Cycle Track (two-way)

Indianapolis, IN



Two-way Cycle Track

Two-way Cycle Track

Chicago, IL

Two-way Cycle Track

Indianapolis, IN

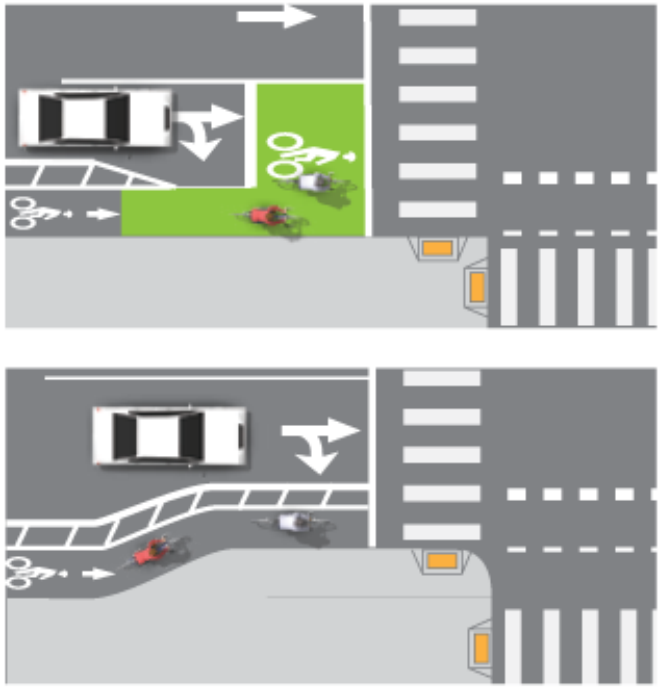
Two-way Cycle Track

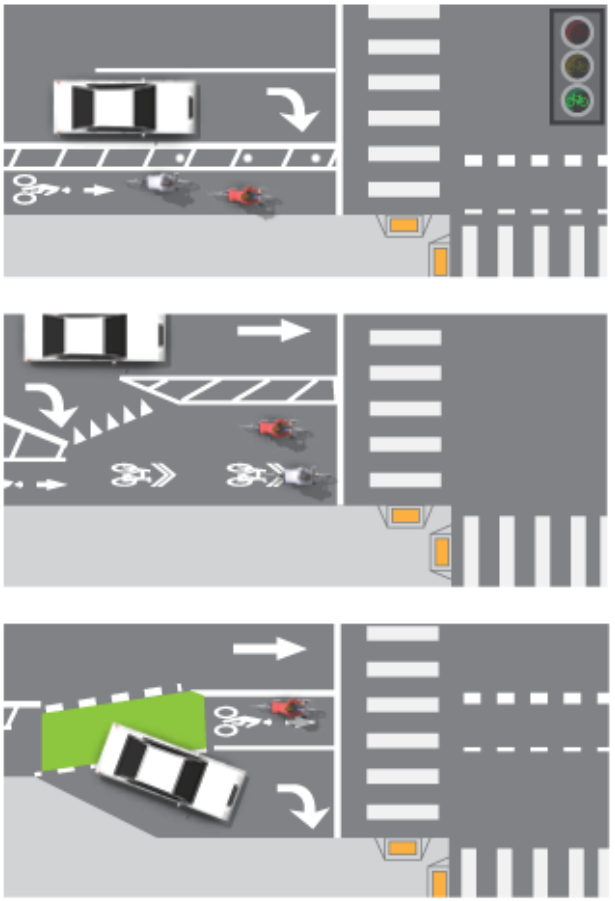
Austin, TX

Mixing Zone

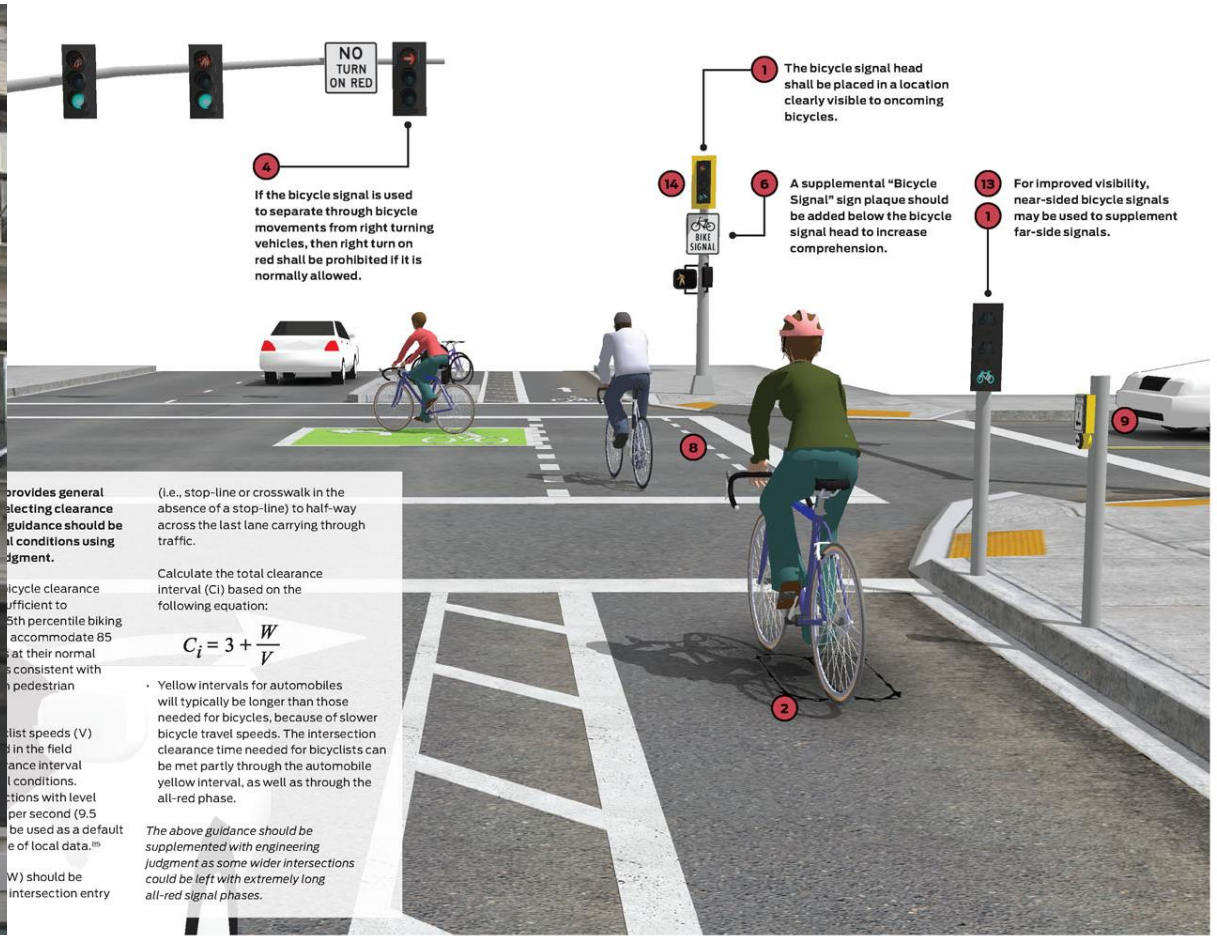
Mixing Zone

New York, NY





Cycle Track Intersection Approach Strategies



Bicycle Signals

Intersection Crossing and Two-stage Turn

Chicago, IL

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