Innovative and Emerging Bicycle Treatments

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Why Are Innovative Bikeways Important?

Source: American Community Survey Bicycle Commuting Trends, 200 to 2008; League of American Bicyclists
Traditional Bikeways

Bike lane in Fresno, CA
Source: Bryan Jones

Sharrows in Sacramento, CA
Low Hanging Fruit and Theoretical Maximum Mode Share
What Types of Bicyclist Are We Trying to Serve?

Source: Four Types of Cyclists, Roger Geller
How to Significantly Affect Mode Share

Bike paths at UC Davis
Source: UC Davis
Traditional Design Standards and Guidance
Traditional Design Standards and Guidance

The American Association of State Highway and Transportation Officials

Federal Highway Administration
The National Association of City Transportation Officials

- Based on innovative design practices around the world
- Concern that AASHTO, FHWA don’t sufficiently address urban transportation needs
- Impatience with MUTCD experimentation process
- Has received both praise and criticism
- Not all treatments consistent with AASHTO/HDM/MUTCD/CVC
Using the Urban Bikeway Design Guide Today

Bicycle Facilities and the Manual on Uniform Traffic Control Devices

Background
The Federal Highway Administration receives occasional inquiries about what bicycle facilities, signs, and markings are permitted in the Manual on Uniform Traffic Control Devices (MUTCD). The table below lists various bicycle-related signs, markings, signals, and other treatments and identifies their status (e.g., can be implemented, currently experimental) in the 2009 version of the MUTCD.

If you have MUTCD-related questions, please contact: Kevin Dunn, MUTCD Team.

<table>
<thead>
<tr>
<th>Description of Bicycle Facilities</th>
<th>Status in the FHWA’s Manual on Uniform Traffic Control Devices (MUTCD)</th>
<th>Are FHWA Experiments in Progress?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffered bike lanes</td>
<td>Can still be implemented at present time if pavement markings and/or creative channelizing devices for bicycles that are compliant with the MUTCD are used. Buffered bike lanes are not experimental. “Yes” is shown in the “Are FHWA Experiments in Progress?” column below because the buffered bike lane(s) in these experiments are testing non-compliant pavement markings.</td>
<td></td>
</tr>
<tr>
<td>Green colored pavement limited to behind the shared lane marking</td>
<td>The FHWA has discontinued the approval of new experiments using this treatment. Agencies that have received prior approval to experiment may continue to operate under the terms of the original experimental approval for the duration of the agreed upon timeframe.</td>
<td></td>
</tr>
<tr>
<td>Green colored pavement to communicate a longitudinal direction with shared lane markings where no bike lane markings are used</td>
<td>The FHWA has discontinued the approval of new experiments using this treatment. Agencies that have received prior approval to experiment may continue to operate under the terms of the original experimental approval for the duration of the agreed upon timeframe.</td>
<td></td>
</tr>
<tr>
<td>Two-stage left turn queue box in any use other than for a jughandle turn at a T-intersection</td>
<td>Previous versions of this Table stated that two-stage left turn queue boxes could be implemented at the present time if signs and markings that are compliant with the MUTCD are used. This has an incorrect entry in the Table. The installation of two-stage left turn queue boxes is experimental except for those that facilitate a jughandle turn at a T-intersection. In order to consider the two-stage left turn queue box for adoption into a future edition of the MUTCD, agencies that have already implemented a two-stage left turn queue box are requested to contact their FHWA Division Office with any information, observations, or data that might be useful in determining future provisions regarding its design or use. Examples of these metrics could include compliance with the no turn on red prohibition(s), user comprehension, vehicle approachment, travel time, etc. Agencies that desire to install two-stage left turn queue boxes at new locations require approval to experiment.</td>
<td>Yes</td>
</tr>
<tr>
<td>Two-stage left turn queue box to facilitate a jughandle turn at a T-intersection</td>
<td>Can be implemented at present time if signs and pavement markings that are compliant with the MUTCD are used</td>
<td></td>
</tr>
</tbody>
</table>

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/guidance/design_guidance/mutcd_bike.cfm
Caltrans Endorses Urban Bikeway Design Guide

- April 10, 2014 – Caltrans’ Director announces endorsement of NACTO Urban Bikeway Design Guide
- Division of Design issues memorandum “Design Flexibility in Multimodal Design”
  “Caltrans is currently analyzing these guides to identify areas of improvement in our own standards and guidance”
- What will make it into the HDM/CAMUTCD?
- California Streets and Highways Code Section 891?
Urban Bikeway Design Guide - Organization

The purpose of the NACTO Urban Bikeway Design Guide (part of the Cities for Cycling initiative) is to provide cities with state-of-the-practice solutions that can help create complete streets that are safe and enjoyable for bicyclists.

http://nacto.org/cities-for-cycling/design-guide/
Bicycle Boulevards

Collection of treatments:
• Wayfinding
• Route planning
• Traffic calming
• Crossing treatments
• Traffic control adjustments

FHWA Status: depends on treatment

Source: DavidBaker+Partners.com
Advisory Bike Lanes

For narrow, low speed, low volume roadways
• 5’/14’/5’ minimum
• 7’/18’/7’ preferred

FHWA Status: experimental

Source: bikewalktwincities.org
Contra-Flow Bike Lanes

Allow bicyclists to ride in the opposite direction of motor vehicle traffic

• Separate opposing traffic with yellow pavement markings
• CAMUTCD minimum widths apply

FHWA Status: can be implemented at present time

Source: NACTO
Buffered Bike Lanes

Uses pavement markings to separate bicycle lane/travel lane or bicycle lane/on-street parking

- Buffer width: 18” minimum, 3’ preferred
- Bike lane width: 5’ minimum, 7’ preferred
- Preferred to keep bike lane out of door zone

FHWA Status: can be implemented at present time
Green Bike Lanes

Increases visibility
• Can be used in marked bicycle lanes and extensions of bicycle lanes through intersections
• Anti-slip materials should be used

FHWA Status: can be implemented at present time
One-Way Cycle Tracks

Physically separates bicyclist space from travel lanes via vertical devices
- Delineator posts, planters, on-street parking
- Buffer width*: 3’ minimum, 4’ preferred
- Clear width for bicyclists: 5’ minimum, 7’ preferred

FHWA Status: “Not a traffic control device”
*Depends on configuration

Source: Chicago DOT
One-Way Raised Cycle Tracks

Elevates cycle track to curb level
• Requires separation from parked cars
• Requires separation from pedestrian space

FHWA Status: “Not a traffic control device”

Source: NACTO
Two-Way Cycle Tracks

Similar to one-way cycle tracks, except two-way
• Can be in street or raised
• Driveways, pedestrian conflicts, intersections, sight lines all challenges to implementation

FHWA Status: “Not a traffic control device”

Source: Chicago DOT
Combined Bike Lane/Turn Lane

When there isn’t enough space for a bike lane and a right-turn pocket
• Minimum bike lane width: 4’
• Maximum total width: 13’

FHWA Status: *Can be implemented at present time if sharrows are used instead of bike lane markings*

Source: NACTO
Bike Box

Allows bicyclists to get ahead of traffic during the red signal phase

- 10-16’ deep
- Requires no right-turn on red
- Green pavement optional

FHWA Status: experimental

Source: NACTO
Two-Stage Turn Queue Box

Allows bicyclists to make a left-turn across multi-lane intersections from the right side

• Requires arrow and bike stencil
• Requires no right-turn on red
• Green pavement optional

FHWA Status: experimental

Source: NACTO
Intersection Crossing Markings

Indicate intended path of bicyclists
• Several marking options available

FHWA Status: Can be implemented at present time

Source: NACTO
In Conclusion...

Bikeway design is constantly evolving...
- Stay informed
- Check for consistency with design guidance/standards
- Detailed courses available through ASCE, APBP

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