

## MUTCD: Bicycle and Pedestrian Signs and Markings ... and Experiments

October 21, 2009

Michael M. Moule, PE, PTOE  
Livable Streets, Inc.

---

---

---

---

---

---

---

---

## Acronyms and Definitions

- MUTCD – Manual on Uniform Traffic Control Devices
- NCUTCD – National Committee on Uniform Traffic Control Devices
  - APBP is now a sponsoring organization – one of 40 votes on NCUTCD Council
- TCDs – Traffic Control Devices (mainly signs, markings, and signals)
- FHWA – Federal Highway Administration

---

---

---

---

---

---

---

---

## Agenda

- Pedestrian and Bicycle changes to the MUTCD:
  - 2000 and 2003 Editions
  - Draft 2009 (2010?) Edition
- Experimentation Process
- Current Experiments being conducted
- Other MUTCD changes being considered

---

---

---

---

---

---

---

---

# Pedestrian and Bicycle Related Changes to the 2000 and 2003 MUTCD Editions

---

---

---

---

---

---

---

---

## Pedestrian Crossing Warning Signs

Old (1988)      New (2000 and later)

Advance of  
Crosswalk



At the  
Crosswalk



Note: Fluorescent Yellow-Green optional for all P & B warning signs since 2000

---

---

---

---

---

---

---

---

## In-street Pedestrian Crossing Signs Added in 2003 MUTCD



Yield or Stop depends on state law

---

---

---

---

---

---

---

---

## Advance Yield Line and Sign Added in 2003 MUTCD




---

---

---

---

---

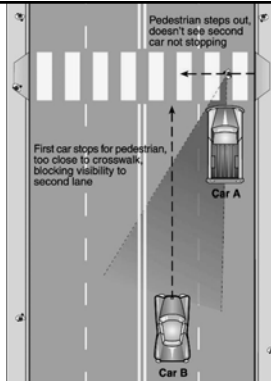
---

---

---

## Multiple Threat Crash Problem

1<sup>st</sup> car stops to let pedestrian cross, blocking sight lines  
 2<sup>nd</sup> car doesn't stop, hits pedestrian at high speed




---

---

---

---

---

---

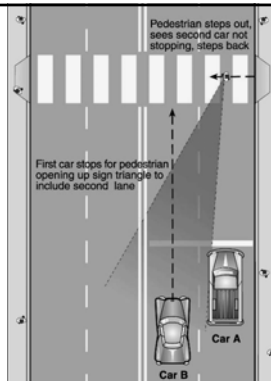
---

---

## Multiple Threat Crash Solution:

### Advance Yield Line

1<sup>st</sup> car stops further back, opening up sight lines  
 2<sup>nd</sup> car can be seen by pedestrian




---

---

---

---

---

---

---

---

**Recommendation that longitudinal crosswalk markings (when used) be spaced to avoid wheel paths (2003)**



---

---

---

---

---

---

---

---

**Countdown Pedestrian Signals (2003 MUTCD)**



---

---

---

---

---

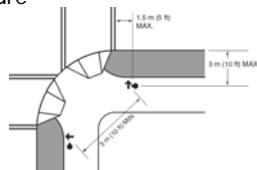
---

---

---

**Other Signal Changes for Pedestrians**

- Accessible Pedestrian Signals – language updated 2000, 2003, draft 2009, and future
- Pushbutton Placement – better guidance in 2003, draft 2009, and future



---

---

---

---

---

---

---

---

## Bike Lane Signs



1988  
MUTCD



2000  
MUTCD



2003 MUTCD

apbp

Association of Pedestrian and Bicycle Professionals  
Experts for sustainable transportation



13

---

---

---

---

---

---

---

---

---

---

## Share the Road Sign Assembly (2000 MUTCD)



W11-1



W16-1

- Falling out of favor with many practitioners
- Even discussion of removing it from MUTCD

apbp

Association of Pedestrian and Bicycle Professionals  
Experts for sustainable transportation



14

---

---

---

---

---

---

---

---

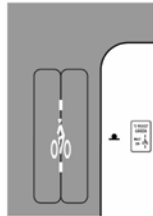
---

---

## New Sign and Marking for Bicycle Detection at Signals (2003)



Bicycle detector sign (R10-22) & marking



Example of detector marking at intersection

apbp

Association of Pedestrian and Bicycle Professionals  
Experts for sustainable transportation



15

---

---

---

---

---

---

---

---

---

---

## Other New Signs in 2003



---

---

---

---

---

---

---

---

## Next MUTCD (Hopefully 2009)

- Draft was released in January 2008 (NPA – Notice of Proposed Amendments)
  - 6 month public comment period
  - NCUTCD recommended changes
  - Thousands of comments received
- FHWA has stated that a new MUTCD or a Supplemental NPA will be published this year
  - A supplemental NPA will result in about a 2-year delay
  - Interim Approvals will be requested if there is an SNPA



---

---

---

---

---

---

---

---

## Pedestrian-Related Changes Anticipated in the 2009 MUTCD

- Countdown Pedestrian Signals
  - Required for all new pedestrian signals
  - New meaning of flashing hand with countdown
- Easier-to-meet Ped. Volume Warrant for signals
- Pedestrian walking speed reduced to 3.5 ft./sec.
- Guidance for Marking Crosswalks
- Fluorescent Yellow Green may be required for pedestrian warning signs in the future



---

---

---

---

---

---

---

---

## Advance Stop Line and Sign



---

---

---

---

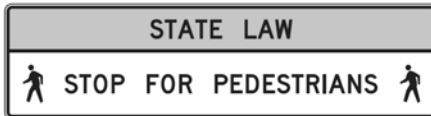
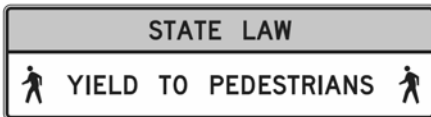
---

---

---

---

## Overhead Yield to Pedestrians Sign (similar to in-street sign)



---

---

---

---

---

---

---

---

## Pedestrian Hybrid "Beacon" or "Signal" (HAWK)



---

---

---

---

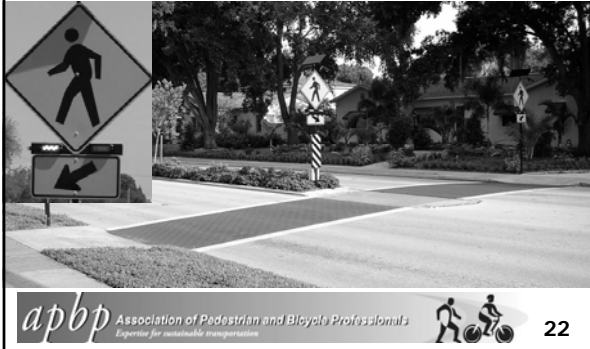
---

---

---

---

## Rectangular Rapid Flash Beacon



---

---

---

---

---

---

---

---

## Bicycle-Related Changes Anticipated in the 2009 MUTCD

- Combined Bicycle and Pedestrian Warning Sign for Trail Crossings
- Bike Lane signs will be optional (may supplement markings)
- Revised numbered bike route sign (M1-8)
- Mode Specific Permission and Prohibition Signs



---

---

---

---

---

---

---

---

## Bicycle-specific Direction, Destination and Distance Signs



---

---

---

---

---

---

---

---

## Bicycles May Use Full Lane Sign

Alternative to Share the Road



---

---

---

---

---

---

---

---

## Shared Lane Markings



---

---

---

---

---

---

---

---

## Official Experiments

- Experiments are for testing or evaluating a new TCD or an application not in the MUTCD
- FHWA must approve experiments
- New devices are rarely added to the MUTCD without research
- Official experiments require research
- MUTCD Section 1A.10 describes how to submit a request to experiment



---

---

---

---

---

---

---

---

## Advantages of Official Experiments

- Protection from liability
- Expert review and oversight
- FHWA is more likely to accept research results
- Positive research results of official experiments usually result in a change to the MUTCD

---

---

---

---

---

---

---

---

## Disadvantages of Using the Experimentation Process

- FHWA may reject the proposed experiment
- FHWA may require a change in how the new traffic control device or application is used
- Research is usually funded by the jurisdiction
- Semi-annual progress reports are required

Requests to change the MUTCD can be submitted based on independent research

---

---

---

---

---

---

---

---

## Pedestrian TCD Experiments Underway (And Other Research)

- Enlarged Pedestrian Signal Symbols and Countdown Numbers
- Continued Study of the Rectangular Rapid Flash Beacon
- Pedestrian Hybrid Beacon safety record – crash reductions for peds and all crashes found

---

---

---

---

---

---

---

---

## Bicycle TCD Experiments Currently Underway



---

---

---

---

---

---

---

---

## Shared Lane Markings



Dozens cities are using SLMs in now;  
many made experimentation requests:

- |                    |                      |
|--------------------|----------------------|
| Flagstaff, AZ      | Fort Collins, CO     |
| Miami Beach, FL    | Louisville, KY       |
| Ann Arbor, MI      | Marquette, MI        |
| Minneapolis, MN    | Columbia, MO         |
| Ithaca, NY         | Columbus, OH         |
| Cincinnati, OH     | Portland, OR         |
| Bethlehem, PA      | Pittsburgh, PA       |
| Spartanburg, SC    | Austin, TX           |
| Salt Lake City, UT | Alexandria, VA       |
| Bellevue, WA       | Redmond, WA          |
| Spokane, WA        | Sheboygan County, WI |



---

---

---

---

---

---

---

---

## Colored Bike Lanes

Experiments have been approved in several cities:

- San Francisco, CA
- St. Petersburg, FL
- Columbia, MO
- Portland, OR
- Austin, TX
- Salt Lake City, UT



---

---

---

---

---

---

---

---

## Bike Boxes

Experiments have been approved in several cities:

- Phoenix, AZ
- Columbus, OH
- Portland, OR
- Austin, TX



---

---

---

---

---

---

---

---

## Green Shared Lane – Long Beach



---

---

---

---

---

---

---

---

## Bike Signal

- Denver has completed a study and final report
- Long Beach is studying bike signals in the context of a barrier separated bike lane



---

---

---

---

---

---

---

---

## Other Pedestrian TCD Changes Being Considered for the MUTCD

- Recommendation to ensure that street name signs face both ways on one way streets
- Stronger language requiring/recommending pedestrian signals at signalized intersections
- Countdown Ped Signals during yellow interval
- Continued changes to Accessible Pedestrian Signal Requirements

---

---

---

---

---

---

---

---

---

---

## Post-mounted Yield to Pedestrians Sign




---

---

---

---

---

---

---

---

---

---

## Other Bicycle TCD Changes Being Considered for the MUTCD

- Signs for bicyclists on freeways
- Door zone markings
- Bike merge signs and markings
- Work Zone figures for bicyclists
- Additional Shared Lane Marking configurations
- Bike markings at interchanges

---

---

---

---

---

---

---

---

---

---

## "Except Bicycles" Plaque

- Many possible applications:
  - Bicycle Boulevards
  - Contra-Flow Bike Lanes
- Already legal to use and used in many places
- Adding it to the MUTCD makes it easier to use
- Latest design uses bike symbol



---

---

---

---

---

---

---

---

## Combined Bike / Right Turn Lane



This is an old installation – new proposal will use SLM



---

---

---

---

---

---

---

---

## To Experiment or Not to Experiment?



Michael M. Moule, PE, PTOE, LCI  
moule@livablestreetsinc.com  
(813) 254-7708  
www.livablestreetsinc.com



---

---

---

---

---

---

---

---

## Other Questions?



**Michael M. Moule, PE, PTOE, LCI**  
**moule@livablestreetsinc.com**  
**(813) 254-7708**  
**www.livablestreetsinc.com**

---

---

---

---

---

---

---

---

## Coming Attractions

November 18: Building Political Will for Strong  
Bike/Walk Programs: Effective Use of the "Three-  
Legged Stool" model in Columbia, Mo.

December 16: Connecting with Public Health  
Professionals on Bicycle and Pedestrian Issues

Visit the event calendar at [www.apbp.org](http://www.apbp.org) for  
more information and to register

---

---

---

---

---

---

---

---

## Thanks for attending this webinar!

Please take a short survey to tell us what you think  
about today's webinar:

[http://www.apbp.org/surveys/default.asp?id=Evaluation\\_Oct-09](http://www.apbp.org/surveys/default.asp?id=Evaluation_Oct-09)

A live link to the survey has already been e-mailed to  
you. Please forward the link anyone who participated  
in the webinar at your site.

---

---

---

---

---

---

---

---

## How to claim credit for CM\* or PDH

To claim credit for Certification Maintenance (AICP) or Professional Development Hours for this webinar:

- Log your attendance on either the CM or PDH sign-in sheet
- Site hosts: return the completed sign-in sheets to APBP after the webinar (fax to 866-720-3611 or e-mail [webinars@apbp.org](mailto:webinars@apbp.org))
- To claim PDH: E-mail [webinars@apbp.org](mailto:webinars@apbp.org) to request a letter certifying your attendance
- To claim CM credit (AICP only): Log on to your account on the APA Web site. The AICP has approved one CM credit for this webinar.



---

---

---

---

---

---

---

---