



National Committee on Uniform Traffic Control Devices

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This is a joint technical committee recommendation by the Bicycle Technical Committee and the Signals Technical Committee of the NCUTCD. It includes language for an Interim Approval for bicycle signal faces. Due to the imposed constraints for the development and submission of this information to FHWA, there was not sufficient opportunity to follow the typical National Committee recommendation review and approval process. The lack of opportunity for face-to-face discussion limited the ability to evaluate and improve the language through a consensus building process. Within the limitations imposed by the process, the language has been reviewed and supported by both the Bicycle Technical Committee and the Signals Technical Committee. It is being distributed to the National Committee sponsoring agencies simultaneously with the submission to FHWA in the event any of the sponsoring agencies wish to send any comments to FHWA.

This joint technical committee recommendation for Interim Approval language is not a revision to the MUTCD and does not constitute official standards, guidance, or options. No proposed revision to the MUTCD is effective unless and until approved by FHWA through an Interim Approval or through the Federal rulemaking process.

TECHNICAL COMMITTEE:	Bicycle Technical Committee and Signals Technical Committee
TOPIC:	Recommended language for an Interim Approval for the use of bicycle signal faces
STATUS/DATE OF ACTION:	Joint recommendation by Bicycle Technical Committee and Signals Technical Committee, 11/08/2013, send to FHWA and to Sponsors
TC Approval:	Signals - 24 FOR, 8 AGAINST (11-07-13) Bicycles - 18 FOR, 1 AGAINST (11-07-13)
Transmitted to FHWA & Sponsors:	Nov. 8, 2013
Council Approval:	N/A

ORIGIN OF REQUEST: FHWA

AFFECTED SECTIONS OF MUTCD: N/A – Interim Approval only

SUMMARY:

Various experimentation has been conducted concerning the provision of signal faces to control bicycle movements at various locations and various conditions. There is a strong desire by interested parties for authorization to install bicycle signal faces to control bicycle movements without having to utilize the formal experimentation process. In late July 2013, FHWA advised representatives of the NCUTCD of consideration of issuing an Interim Approval by the end of 2013 and advised that, if the Bicycle and/or Signals Committees desired to provide any suggestions, recommendations or technical matter for FHWA to consider as the IA is developed, that such input be provided by November 15, 2013.

Since this time frame did not include any NCUTCD meetings and was insufficient for the NCUTCD to utilize its normal recommendation process, the NCUTCD utilized a streamlined process to allow the Bicycle Technical Committee and Signals Technical Committee to develop and consider a joint technical committee recommendation. Each of these technical committees reviewed and approved recommended language for an Interim Approval.

DISCUSSION:

The use of bicycle signal faces has been discussed at recent National Committee meetings at working group sessions. Members from various NC technical committees were interested in this topic. Therefore, the sessions were held Wednesday evenings to allow attendance without attendees having to miss their technical committee sessions.

While various experimentation has been conducted with bicycle signal faces, there is limited availability of research on the design, installation, and operation of bicycle signal faces to control bicycle movements. Therefore, discussions from the working group sessions, as well as input from various current and past technical committee members, have been used to prepare this draft language that will hopefully assist FHWA in the preparation of an IA.

Unlike many traffic control devices that have been included on prior Interim Approvals, a bicycle signal face is not a “stand alone” traffic control device. It will be one component of a traffic control signal used to control all traffic at an intersection or other location such as midblock or at a driveway. Therefore, the design, installation, and operation of bicycle faces must be such that they can be successfully included as part of the traffic control signal. As a result, the draft language for an Interim Approval for bicycle signal faces relies on and borrows heavily from the information included in Part 4 and especially Chapter 4D.

Currently, traffic control signals (other than LRT traffic control signals) are either vehicular signals or pedestrian signals. Since bicycles are vehicles, the addition of

bicycle signal faces may create the need to distinguish between signals that are for motor vehicles and those that are for bicycles at various places throughout the MUTCD. This level of review has not been conducted as part of the Interim Approval language recommendation.

RECOMMENDED LANGUAGE FOR AN INTERIM APPROVAL FOR BICYCLE SIGNAL FACES:

The recommended language, developed and approved by the Bicycle Technical Committee and the Signals Technical Committee, is a joint recommendation from those committees concerning the issuance of an Interim Approval for the use of bicycle signals faces. It has not been reviewed or approved by the NCUTCD and should not be considered an NCUTCD recommendation or endorsement. This language was developed without the opportunity for face-to-face discussion at a National Committee meeting or a formal amendment process. As such, it does not represent the level of quality typically provided by the NCUTCD regarding MUTCD issues.

The Bicycle Technical Committee and the Signals Technical Committee recommend that the following language be considered as an Interim Approval for the use of Bicycle Signals. Note: Text shown in red underline is not part of the recommended language but is included to provide information to FHWA concerning additional information that needs to be added or to provide information about the recommended language.

Interim Approval for the use of Bicycle Signal Faces

Purpose: The purpose of this memorandum is to issue an Interim Approval for the optional use of Bicycle Signal Faces at a traffic control signal under certain limited conditions. Interim Approval allows interim use, pending official rulemaking, of a new traffic control device, a revision to the application or manner of use of an existing traffic control device, or a provision not specifically described in the Manual on Uniform Traffic Control Devices (MUTCD).

A bicycle signal face can be used to:

- a. Control the separation of potentially conflicting movements, such as through bicyclists and turning motor vehicles.
- b. Control a bicycles-only approach to a signalized location.
- c. Provide a leading or lagging bicycle interval.
- d. At a location where it is desirable to provide a green interval for bicycles that is different than the green interval and duration for vehicles and/or pedestrians.”
- e. Address bicycle movements that are not effectively accommodated by typical signal installations and operation.
- f. Address yellow change interval challenges at locations where it is desired to terminate the bicyclist movement prior to the termination of motor vehicle movements.

Background:

To be added by FHWA

Research:

To be added by FHWA

FHWA Evaluation of the Results:

To be added by FHWA

Conditions of Interim Approval: The FHWA will grant Interim Approval for the optional use of Bicycle Signal Faces to control some or all bicycle movements at traffic control signals to any jurisdiction that submits a written request to the Office of Transportation Operations. A State may request Interim Approval for all jurisdictions in that State. Jurisdictions using Bicycle Signal Faces under this Interim Approval must agree to comply with the technical conditions detailed below, to maintain an inventory list of all locations where the devices are placed, and to comply with Item F at the bottom of Page 1A-6 of the 2003 MUTCD, Section 1A.10 which requires:

An agreement to restore the site(s) of the Interim Approval to a condition that complies with the provisions in this Manual within 3 months following the issuance of a Final Rule on this traffic control device. This agreement must also provide that the agency sponsoring the Interim Approval will terminate use of the device or application installed under the Interim Approval at any time that it determines significant safety concerns are directly or indirectly attributable to the device or application. The FHWA's Office of Transportation Operations has the right to terminate the interim approval at any time if there is an indication of safety concerns."

1. General Conditions

- a. Where it is desired to provide separate signal indications to control a bicycle movement and where the bicycle movement is different for some or all of the time that the adjacent motor vehicles making the same movement are allowed to proceed, bicycle signal faces may be used based on engineering judgment or an engineering study.
- b. A Bicycle Signal Face shall consist of three or more signal sections, shall be used to exclusively control a bicycle movement, and shall display signal indications that are applicable only to the bicycle movement.
- c. A Bicycle Symbol Indication shall:
 1. be a red, yellow, or green signal indication that displays a bicycle symbol rather than a circular or arrow indication, and
 2. that is used to direct some or all bicycle movements at a traffic control signal.

Following shows a bicycle face with bicycle symbol indications:



(Note: The circular red, yellow, and green colors surrounding the colored bicycle symbols are to indicate the overall shape of the “lens”. The bicycle symbols are the only portion that is actually illuminated when the indication is on however.)

d. Engineering judgment should be used to determine the need for separate bicycle signal faces. Less restrictive means of mitigating conflicts between bicycles and motor vehicles should be considered first.

2. Allowable Uses

a. A bicycle signal face shall only be used to control bicycle movements from a designated bicycle lane or from a separate facility such as a shared use path, and where the bicycle movement is different for some or all of the time that the adjacent motor vehicles making the same movement are allowed to proceed.

b. A bicycle signal face shall be used only to control bicycle movements and shall consist of three or more signal sections. A bicycle signal face shall consist of either:

1. Signal sections that contains green, yellow, and red bicycle symbol indications, or
2. Signal sections that contain green, yellow, and red circular signal indications or that contain green, yellow, and red arrow signal indications.

c. If a bicycle signal face does not consist of bicycle symbol indications, the indications shall either all be circular indications or shall all be arrow indications.

d. Bicycle signal faces shall not be used at or as part of a hybrid beacon installation.

3. Bicycle Signal Sign

a. A BICYCLE SIGNAL (R10-xx) sign shall be mounted adjacent to (including above or below) a bicycle signal face that does not contain bicycle symbol indications. The BICYCLE SIGNAL (R10-xx) sign shall be retroreflective.



24" x 18" sign size with 11.8" x 8" bicycle symbol, 4" D text

b. A BICYCLE SIGNAL (R10-xx) sign may be mounted adjacent to (including above or below) a bicycle signal face that contains bicycle symbol indications.

4. Bicycle Detection Confirmation Indication

a. A distinctive steady bicycle detection confirmation indication may be provided at a signalized location to show that a bicycle has been detected.

b. If used, a bicycle detection confirmation indication shall be blue, round, 1 to 2 inches in diameter and mounted above or adjacent to the red indication in a bicycle signal face. If used, the bicycle detection confirmation indication shall not be mounted within the bicycle signal face or within a backplate installed on a bicycle signal face.

5. Meaning of Indications in Bicycle Signal Faces

a. Steady green signal indications shall have the following meanings:

1. Bicycle traffic facing a CIRCULAR GREEN signal indication in a bicycle signal face is permitted to proceed straight through or turn right or left or make a U-turn movement except as such movement is modified by lane-use signs, turn prohibition signs, lane markings, roadway design, separate turn signal indications, or other traffic control devices.

Such bicycle traffic, including bicycles turning right or left or making a U-turn movement, shall yield the right-of-way to:

- (a) Pedestrians lawfully within an associated crosswalk, and
- (b) Other vehicles lawfully within the intersection.

In addition, bicycle traffic turning left or making a U-turn movement to the left shall yield the right-of-way to other vehicles approaching from the opposite direction so closely as to constitute an immediate hazard during the time when such turning vehicle is moving across or within the intersection.

2. Bicycle traffic facing a GREEN ARROW signal indication in a bicycle signal face is permitted to cautiously enter the intersection only to make the movement indicated by such arrow. Such bicycle traffic, including vehicles turning right or left or making a U-turn movement, shall yield the right-of-way to:
 - (a) Pedestrians lawfully within an associated crosswalk, and
 - (b) Other vehicles lawfully within the intersection.

- b. Steady yellow signal indications in a bicycle signal face shall have the following meanings:
1. Bicycle traffic facing a steady CIRCULAR YELLOW signal indication in a bicycle signal face is thereby warned that the related green movement is being terminated or that a steady red signal indication will be displayed immediately thereafter when vehicular traffic shall not enter the intersection. The rules set forth concerning vehicular operation under the movement(s) being terminated shall continue to apply while the steady YELLOW signal indication is displayed in a bicycle signal face.
 2. Bicycle traffic facing a steady YELLOW ARROW signal indication in a bicycle signal face is thereby warned that the related GREEN ARROW movement is being terminated. The rules set forth concerning vehicular operation under the movement(s) being terminated shall continue to apply while the steady YELLOW ARROW signal indication is displayed.
- c. Steady red signal indications in a bicycle signal face shall have the following meanings:
1. Bicycle traffic facing a steady CIRCULAR RED signal indication in a bicycle signal face, unless entering the intersection to make another movement permitted by another applicable signal indication, shall stop at a clearly marked stop line; but if there is no stop line, traffic shall stop before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, then before entering the intersection; and shall remain stopped until a signal indication to proceed is displayed, or as provided below.
Except when a traffic control device is in place prohibiting a turn on red or a steady RED ARROW signal indication is displayed, bicycle traffic facing a steady CIRCULAR RED signal indication in a bicycle signal face is permitted to enter the intersection to turn right, or to turn left from a one-way street into a one-way street, after stopping. The right to proceed with the turn shall be subject to the rules applicable after making a stop at a STOP sign.
 2. Bicycle traffic facing a steady RED ARROW signal indication in a bicycle signal face shall not enter the intersection to make the movement indicated by the arrow and, unless entering the intersection to make another movement permitted by another signal indication, shall stop at a clearly marked stop line; but if there is no stop line, before entering the crosswalk on the near side of the intersection; or if there is no crosswalk, then before entering the intersection; and shall remain stopped until a signal indication or other traffic control device permitting the movement indicated by such RED ARROW is displayed.
When a traffic control device is in place permitting a turn on a steady RED ARROW signal indication, bicycle traffic facing a steady RED ARROW signal indication in a bicycle signal face is permitted to enter the intersection to make the movement indicated by the arrow signal indication, after stopping. The right to proceed with the turn shall be limited to the direction indicated by the arrow and shall be subject to the rules applicable after making a stop at a STOP sign.

- d. Red, yellow, and green bicycle symbol indications used in bicycle signal faces shall have the same meaning as circular indications of the same color described above.

6. Design of Bicycle Signal Faces

- a. Unless otherwise noted, the provisions of Section 4D.06 shall apply to bicycle signal faces.

- b. If circular or arrow indications are used in a bicycle signal face, the circular or arrow indications shall be as described in Part 4.

- c. Bicycle symbol indications shall use the design of a bicycle symbol shown in figure x.x (The figure is not included. Our recommendation to FHWA will note that they need to include a figure showing the bicycle symbol design.)

- d. The bicycle symbol used for bicycle symbol indications shall be proportioned to fit within the 12" or 8" diameter signal lens. For a 12-inch diameter lens, the overall width of the bicycle symbol shall be at least ___ inches. For an 8-inch diameter lens, the overall width of the bicycle symbol shall be at least ___ inches. (The bicycle symbol width dimensions to be added by FHWA.)

- e. Bicycle signal faces shall utilize either 8-inch or 12-inch signal indications except as described in #6f allowing the use of signal faces with 4-inch signal indications for supplemental nearside bicycle signal faces. All indications in a given bicycle signal face shall be the same size.

- f. Supplemental near-side bicycle signal faces may be used. Where used, a supplemental near-side bicycle signal face may have nominal 4-inch diameter indications. See #6o for additional information about supplemental near-side bicycle signal faces.

- g. Red, yellow, and green indications in a bicycle signal face shall be in the same relative position to each other as specified in Sections 4D.09 and 4D.10 for signal indications.

- h. When a bicycle signal face is provided, only one bicycle signal face shall be required for the bicycle movement.

- i. Indications in bicycle signal faces should be shielded, hooded, louvered, positioned, or designed such that they are not readily visible to drivers in adjacent lanes.

- j. At installations where visibility-limited signal faces are used, bicycle signal faces shall be adjusted so bicyclists for whom the indications are intended can see the signal indications.

- k. A bicycle signal face shall be located no more than 180 feet beyond the stop line unless a supplemental near-side bicycle signal face is provided.
- l. For the purposes of bicycle signal faces with 4-inch nominal diameter indications, a near-side bicycle signal face shall be a bicycle signal face that is not located over the roadway and is located in advance of the intersection (in advance of the curb or extension of the curb).
- m. Unless otherwise specified in this chapter, bicycle signal faces shall meet the mounting height and lateral offset requirements in Sections 4D.13, 4D.14, and 4D.16.
- n. The bottom of the housing of a bicycle signal face with 12-inch or 8-inch nominal diameter indications and not located over a roadway shall be a minimum of 8 feet and a maximum of 19 feet above the sidewalk or, if there is no sidewalk, above the pavement grade at the center of the roadway.
- o. If used, 4-inch nominal diameter near side bicycle signal faces shall be mounted with the bottom of the signal housing, including brackets, not less than 4 feet above the sidewalk or ground, nor more than 8 feet above the sidewalk or ground. Bicycle signal faces with 4-inch nominal indications should not have visors or backplates.
- p. The lateral offset provisions for signal faces in Section 4D.16 shall apply to bicycle signal faces with 12-inch or 8-inch indications. The lateral offset for signal faces with 4-inch nominal diameter indications may be less than the minimum lateral offset in Section 4D.16.

7. Bicycle Signal Face Operation

- a. If bicycle signal faces are installed at a traffic control signal, the mode of operation of the bicycle signal faces shall be the same as the mode for the vehicular signal faces. Bicycle signal faces shall operate in the steady mode when vehicular signal faces are operating in the steady mode and bicycle signal faces shall operate in flashing mode when vehicular signal faces are operating in the flashing mode.
- b. Information on signal intervals for bicyclists can be found in:
 - 1. "Guide for Development of Bicycle Facilities," which is available from the American Association of State Highway and Transportation Officials (see Page i for the address); and
 - 2. State and local government design guides.
- c. If one or more bicycle signal faces are installed at a location where vehicular indications are designed and operated to respond to certain classes of approaching vehicles by altering the normal signal timing and phasing plan(s) during the approach and passage of those vehicles, the operation of the bicycle signal faces

shall also be modified if or as necessary to facilitate the approach and passage of those certain classes of approaching vehicles. See Section 4D.27.

d. To the extent practicable, the provisions of Sections 4D.28, 4D.29, 4D.30, and 4D.31 concerning flashing operation shall apply to bicycle signal faces.

e. The operation of bicycle signal faces must be considered when the traffic control signal is transition into and out of flashing mode of operation and when it is in the flashing mode of operation. Therefore, the applicable sections in Chapter 4D are referenced.

f. A yellow change interval displayed in a bicycle signal face may occur simultaneously with the yellow change interval displayed in signal faces for the through motor vehicle traffic in the same direction. If a yellow change interval displayed in a bicycle signal face does not occur simultaneously with the yellow change interval displayed in signal faces for the through motor vehicle traffic in the same direction, the duration of the yellow change interval displayed in a bicycle signal face shall not be less than 3.0 seconds.

8. Exceptions to existing MUTCD

a. As a specific exception to 2009 MUTCD Section 4D.06 requirements for the shape of signal indications, bicycle signal face may utilize bicycle symbols indications that display an illuminated red, yellow, or green bicycle symbol.