



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

400 Seventh St., S.W.  
Washington, D.C. 20590

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Refer to: HOTO-1

Mr. K.C. Matthews  
Traffic Specs and Standards Engineer  
HQ Safety and Traffic Engineering  
Colorado Department of Transportation  
4201 East. Arkansas Avenue, EP 770  
Denver, CO 80222

Dear Mr. Matthews:

Thank you for your December 23 email to Mr. Scott Wainwright of our staff, requesting an official interpretation of the Manual on Uniform Traffic Control Devices (MUTCD) regarding the use of a red arrow signal indication in a 5-section signal face for variable mode left turns. You also asked whether the specific "offset" configuration of signal sections used by Colorado for 5-section signal faces is allowed by the MUTCD.

In Section 4D.06 (Application of Steady Signal Indications for Left Turns), item D provides the requirements applicable to Variable Left-Turn Mode and states: "If the protected only mode occurs during one or more periods of the day, and the permissive only mode or the combined protected/permissive mode occurs during other periods of the day, the requirements of Items A, B, and C in this Standard that are appropriate to that mode of operation shall be met, subject to the following:

1. The CIRCULAR GREEN and CIRCULAR YELLOW signal indications shall not be displayed when operating in the protected only mode.
2. The left-turn GREEN ARROW and left-turn YELLOW ARROW signal indications shall not be displayed when operating in the permissive only mode."

During the times of day when protected only mode is in operation, item B and item D.1 of Section 4D.06 apply. Those items require a separate (third) signal face specifically for the left turn lane and the indications illuminated during the sequence must be either: a) green arrow, yellow arrow, and red arrow, or b) green arrow, yellow arrow, and circular red (with the circular red being visibility-limited or else accompanied by an R10-10 sign.) The use of a red arrow during protected-only mode is therefore specifically allowed.

During the times of day when protected-permissive left turn (PPLT) mode is in effect, item C of Section 4D.06 applies and this allows either a shared face or a separate face for PPLT mode. Since a separate face is required for the protected-only times, the same separate face would also be used for the PPLT times. In order to display the circular green and circular yellow indications



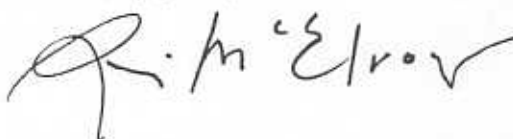
required by item C for the permissive portion of the PPLT mode, this signal face would need to be comprised of 5 sections. (The circular green and circular lenses would not be illuminated at any time when the protected-only mode is operating.) Nothing in item C (or anywhere else) prohibits the use of a red arrow in that separate face as the red indication for the left turn lane when it is operating in the PPLT mode.

It is inherent in the provisions of Section 4D.06 regarding variable mode that the signal display sequence shown to road users in the left turn lane must be appropriate for the mode that is operating at any given period of the day and not be different from what road users encounter at locations where that mode is in operation at all times of the day. Therefore, if a red arrow is used in the 5-section separate signal face for the left turn lane, during PPLT mode times that red arrow cannot be displayed simultaneously with any green or yellow circular or arrow indications in the 5-section face. During PPLT mode, the red arrow can only be displayed when the adjacent thru signal faces are displaying red, but it cannot be displayed simultaneously with the left turn green arrow when the adjacent thru signal face is displaying red, such as occurs in a typical "quad left" PPLT operation. Also, care must be exercised to assure that none of the prohibited displays as stated in Section 4D.08 occur under any of the potential sequences that can occur in complex signal phasing, particularly if actuated phases can be skipped.

You also asked whether Colorado's use of an "offset" 5-section signal face (two sections on the left side and three sections on the right side) rather than a "doghouse" (as shown in Figure 4D-3, illustrations "o" and "q") is allowed by the MUTCD. Section 4D.16 contains this Standard statement: "The signal lenses in a signal face shall be arranged in a vertical or horizontal straight line, except that in a vertical array, signal lenses of the same color may be arranged horizontally adjacent to each other at right angles to the basic straight line arrangement. Such clusters shall be limited to two identical signal lenses or to two or three different signal lenses of the same color." Figure 4D-3 is titled "Typical Arrangements of Signal Lenses in Signal Faces." Nowhere is it stated or implied that these are the only allowable arrangements. In fact, the last sentence of Section 4D.16 states: "Figure 4D-3 illustrates some of the possible arrangements of signal lenses in signal faces." Therefore, the offset arrangement is allowed by the MUTCD, as long as the alignment is such that the green arrow is horizontally aligned with the circular green and the yellow arrow is horizontally aligned with the circular yellow.

Thank you for writing on this subject. If you have any questions, please email Mr. Wainwright at [scott.wainwright@fhwa.dot.gov](mailto:scott.wainwright@fhwa.dot.gov) or call him at 202-366-0857. Please note that we have assigned your request the following official interpretation number and title: "4-286(I)—Use of Red Arrow in 5-Section Signal Face." Please refer to this number in any future correspondence on this matter.

Sincerely yours,



Regina S. McElroy  
Director, Office of Transportation  
Operations

cc: Mr. Jim Baron, ATSSA