

March 10, 2011

TRAFFIC ENGINEERING DIRECTIVE
402-4

Supersedes 402-3

**SUBJECT: TYPICAL PLACEMENT OF TRAFFIC SIGNAL FACES
FOR VARIOUS INTERSECTION CONFIGURATIONS**

The following criteria establish guidelines for the placement of traffic signal faces giving consideration to the specific conditions set by roadway geometrics and signal phasing. It is recognized, however, that there are instances where these guidelines may not be practical, or where geometrics and phasing are not as described in this directive. When either is the case, these guidelines should be followed as closely as possible.

The primary requirement is that two signal heads must be visible to approaching drivers, and that the rules for the 40 degree CONE OF VISION as described in the Manual on Uniform Traffic Control Devices (MUTCD) shall be followed. The minimum distance from stop bar to a signal face shall be 40 feet and the maximum distance should be 150 feet. Any proposal to install signal heads more than 150 feet from the stop bar must be approved by the Traffic Engineering Division before proceeding.

Signal faces should be placed in accordance with the horizontal and vertical criteria, detailed below, and should also be visible to pedestrian traffic. Where the faces for vehicular traffic are not visible to the pedestrian, additional signal faces with 8-inch lenses may be placed in a visible location. The use of cutaway rather than tunnel visors may also enhance visibility. Pedestrian heads should be considered where pedestrian traffic is significant or where conditions meet those described in 4E.03 of the MUTCD.

VERTICAL LOCATION OF TRAFFIC SIGNAL FACES

The bottom of the housing of a signal face not mounted over a roadway shall not be less than 12 feet nor more than 15 feet above the sidewalk or, if none, above the pavement grade at the center of the highway. The standard height shall be 10 feet + or - 3 inches for pedestal-mounted pedestrian signals and 12 feet + or - 3 inches for pole-mounted vehicular signals.

The bottom housing of a signal face suspended over a roadway shall be 18 feet + or - 3 inches above the pavement grade at the center of the roadway. The maximum height shall be 19 feet.

NUMBER AND HORIZONTAL LOCATION OF TRAFFIC SIGNAL FACES

For multilane facilities, one signal head per through lane for any one direction or approach is normally used. A minimum of 2 signal heads for any one direction or approach shall be used. The signal faces shall not be less than 8 feet apart measured horizontally between centers of faces. More specific guidelines are as follows:

1. **Single-Lane Approach**
One signal head is normally placed 2 feet right of the centerline of the approach and the second head is placed a minimum of 8 feet to the right of that near the right edge line.
2. **Exclusive Left Turn Lane (Permissive Only Mode)**
A signal head shall not typically be placed over this turn lane. In this situation, one of the required signal heads for the approach may be placed over the channelizing line separating the left turn lane and the adjacent through lane, serving as a shared indication.
3. **Exclusive Left Turn Lane (Protected/Permissive Mode)**
A clustered five section head containing a YELLOW ARROW and GREEN ARROW on the left side of the cluster and a RED BALL, YELLOW BALL, and GREEN BALL on the right side of the cluster shall typically be placed above the channelizing line separating the left turn lane and adjacent through lane, serving as a shared indication. This signal head shall serve as one of the minimum required signal heads for the approach.
4. **Exclusive Left Turn Lane (Protected Only Mode)**
A three section head containing a RED ARROW, YELLOW ARROW, and GREEN ARROW shall be placed over the center of the left turn lane. However, if the heads facing the left turn lanes block each other, the left turn signal head on each approach is to be placed 2 feet right of the center of the approach lane. This signal head is in addition to the minimum required signal heads for the approach based upon the lane configuration and number of through lanes.
5. **Exclusive Right Turn Lane (Permissive Only Mode)**
A signal head is typically not placed over this lane. In this situation, one of the required signal heads for the approach may be placed over the channelizing line separating the right turn lane and the adjacent through lane, serving as a shared indication.
6. **Exclusive Right Turn Lane (Overlap Mode)**
A clustered five section signal head containing a RED BALL, YELLOW BALL, and

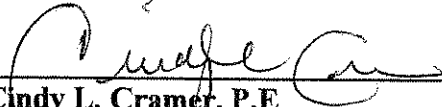
GREEN BALL on the left side of the cluster and a YELLOW ARROW and GREEN ARROW on the right side of the cluster shall be used in this situation. The five section head may be placed over the channelizing line separating the right turn lane and the adjacent through lane, serving as a shared indication. This head may serve as one of the required signal heads for the approach.

7. Approach With No Through Lane

There may be some approaches that have no through lane such as "T" type intersections and approaches that are opposed by one-way streets. In this situation, one signal head per lane may be used with a minimum of 2 signal heads required for the approach. The appropriate YELLOW ARROW and GREEN ARROW may be used instead of a YELLOW BALL and GREEN BALL if there is no existing pedestrian or vehicular conflict for that movement. A RED BALL shall still be used in this case.

8. Supplemental Signal Heads

Supplemental signal heads should be used if sight distance to the intersection is limited by horizontal or vertical alignment, or if engineering judgment has shown they are needed to achieve intersection visibility. Supplemental heads should be three section with circular indications unless it is placed to control a right turn lane in overlap mode, in which case it should be a clustered five section head as described in item 6 above.



Cindy L. Cramer, P.E.
Director - Traffic Engineering Division