

**National Committee on Uniform Traffic Control Devices
TECHNICAL COMMITTEE RECOMMENDATION
Approved by NCUTCD Council - January 7, 2005**

TECHNICAL COMMITTEE: **Regulatory/Warning Signs TC**

DATE OF ACTION:

REQUEST NUMBER:

TOPIC: **Placement of Warning Signs, Section 2C.05**

Reference MUTCD 2003, pages 2C-3 through 2C-6.

DISCUSSION:

1. The older terminology of PIEV Time has been replaced with the current term Perception-Response Time commonly referred to as PRT. A decision was made at the time that the MUTCD 2000 text was developed that PIEV was more widely understood and it was appropriate to carry that terminology over into the new Manual. Perception-Response Time (PRT) has come into common use and is the terminology used in the current AASHTO Policies. The Traffic Control Devices Handbook, pages 34 to 39, addresses both terms but correctly identifies PRT as the terminology now in common use. Accordingly, it is appropriate to update the MUTCD using the common terminology PRT. The text of Section 2C.05 as well as the notes for Table 2C-4 have been revised replacing “PIEV time” with “PRT”.
- 2 . It has been noted that the Table for Placement of Warning Signs should not be definitive requirements but provide some latitude for the exercise of engineering judgment in the field. Variations in the sign placement distances because of roadway or geographical features (driveways, streams) and alignment (horizontal and vertical curves) should be provided where needed. A review of the text for Section 2C.05 provides considerable latitude for placement decisions using the terminology “as an aid”, guidance purposes only and use of engineering judgment. Some jurisdictions have interpreted the placement Table to be specific requirements without room for field adjustments. It appears important enough to clarify that the placement distances are not definitive values and that these distance can be adjusted for roadway features. Accordingly, a sentence has been added in the support information to clarify that flexibility.

VOTE: June 24, 2004

Approved by Regulatory and Warning Sign
Technical Committee for transmittal to
Sponsors for comment.

NOTE: Recommended deletions shown as ~~strikeouts~~ and additions as underlined.

RECOMMENDED WORDING: It is recommended that **Section 2C.05, Placement of Warning Signs**, be revised as follows;

~~The total time needed to perceive and complete a reaction to a sign is the sum of the times necessary for Perception, Identification (understanding), Emotion (decision making), and Volition (execution of decision), and is called the PIEV time. The PIEV time can vary from several seconds for general warning signs to 6 seconds or more for warning signs requiring high road user judgment.~~

The time needed for detection, recognition, decision, and reaction is called the Perception-Response Time (PRT). Table 2C-4 lists suggested sign placement distances for two conditions. This table is provided as an aid for determining warning sign location. The distances listed in Table 2C-4 can be adjusted for roadway features, other signing, and to improve visibility.

Guidance:

Warning signs should be placed so that they provide adequate ~~PIEV time~~ PRT. The distances contained in Table 2C-4 are for guidance purposes and should be applied with engineering judgment. Warning signs should not be placed too far in advance of the condition, such that drivers might tend to forget the warning because of other driving distractions, especially in urban areas.

Minimum spacing between warning signs with different messages should be based on the estimated ~~PIEV time~~ PRT for driver comprehension of and reaction to the second sign.

The effectiveness of the placement of warning signs should be periodically evaluated under both day and night conditions.

Option:

Warning signs that advise road users about conditions that are not related to a specific location, such as Deer Crossing, or SOFT SHOULDER, may be installed in an appropriate location, based on engineering judgment, since they are not covered in Table 2C-4.

It is further recommended that the NOTES for Table 2C-4, both Metric and English Units, be revised as indicated below:

**Table 2C-4. Guidelines for Advance Placement of Warning Signs
(Metric Units)**

Notes:

1. The distances are adjusted for a sign legibility distance of 50 m for Condition A which is based on a word legend height of 13 centimeters. The distances for

Condition B have been adjusted for a sign legibility distance of 75 m which is appropriate for an alignment warning symbol sign.

2. Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends.. The distances are determined by providing the driver a PIEV-time PRT of 14.0 to 14.6 seconds for vehicle maneuvers (2001 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 50 m for the appropriate sign.
3. Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Advance Warning signs. The distances are based on the 2001 AASHTO Policy, Stopping Sight Distance, Exhibit 3-1, providing a PIEV-time PRT of 2.5 seconds, a deceleration rate of 3.4 m/second² minus the sign legibility distance of 50 m. .
4. Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PIEV-time PRT, a vehicle deceleration rate of 3 m/second² minus the sign legibility distance of 75 m.
5. No suggested minimum distances are provided for these speeds, as the placement location is dependent on site conditions and other signing to provide an adequate advance warning for the driver.

**Table 2C-4. Guidelines for Advance Placement of Warning Signs
(English Units)**

Notes:

1. The distances are adjusted for a sign legibility distance of 175 ft. for Condition A which is based on a word legend height of 5 inches. The distances for Condition B have been adjusted for a sign legibility distance of 250 ft. which is appropriate for an alignment warning symbol sign.
2. Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PIEV-time PRT of 14.0 to 14.6 seconds for vehicle maneuvers (2001 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 175 ft. for the appropriate sign.
3. Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Advance Warning

signs. The distances are based on the 2001 AASHTO Policy, Stopping Sight Distance, Exhibit 3-1, providing a ~~PHEV-time~~ PRT of 2.5 seconds, a deceleration rate of 11.2 ft/second² minus the sign legibility distance of 175 ft.

4. Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second ~~PHEV-time~~ PRT, a vehicle deceleration rate of 10 ft/second², minus the sign legibility distance of 250 ft.
5. No suggested minimum distances are provided for these speeds, as the placement location is dependent on site conditions and other signing to provide an adequate advance warning for the driver.