

Warning Sign Placement

Warning signs should be placed to allow adequate time for a driver to perceive, identify, decide, and perform any necessary maneuver. The total time required to perceive and react to a situation is referred to in the *MUTCD* as perception, identification, emotion, and volition, or PIEV time. PIEV time can vary from about 2 seconds for general warning signs to as much as 10 seconds where higher driver judgement is required. Please refer to Section 2C.05 of the *MUTCD* for more details.

The following table suggests minimum warning sign placement locations that may be used for three conditions:

- Condition A—high driver judgement required. Typical situations are merges, lane reductions, and narrow bridges, usually on high-volume, high-speed roads.
- Condition B—stop condition. Drivers may be required to come to a complete stop such as signalized or stop-controlled intersections, crossroads, and pedestrian or school crossings.
- Condition C—deceleration condition. Drivers may be required to reduce speed to make the proper maneuver, such as a curve, turn, dip, or low clearance.

The above information should be considered minimum requirements and engineering judgement must be exercised with these applications.

In some locations, a supplemental advisory plate with distance noted may be used where an

intermediate side road exists between the sign and the condition. This will avoid confusion for the driver about the location to which the warning pertains.

Other miscellaneous warning signs not related to a specific location, such as Rough Road (W8-8) and Soft Shoulder (W8-4), may be installed in the most appropriate location available. Minimum spacing between warning signs with different messages should normally be based on PIEV times for driver comprehension and reaction.



W8-8



W8-4

Some advance warning sign locations are fixed points, such as speed limit changes, no passing zones, etc.; but reasonable flexibility is allowed in the location of many other warning signs. When deciding location for these signs, be sure to consider surrounding terrain and visibility constraints.

Cut sections or narrow right of way may restrict desired height and lateral displacement of sign placement. Obstructions, such as trees, buildings, utility poles, bridge piers, and other signs, may hamper visibility. Existing driveways, side roads, and other features may also affect sign placement. In general, always increase warning sign placement distance when obstacles to the ideal location are encountered.

If signs are mounted back to back, care should be taken to assure the shape or outline of either sign is not obscured.

The effectiveness of any warning sign placement should be reviewed periodically, both day and night.

A guide for advanced warning sign placement distance (in feet)¹

Posted or 85 th Percentile Speed (mph)	Condition A High Judgement Needed ²	General Warning Signs						
		Condition B Stop Condition ³	Condition C—Deceleration Condition to Listed Advisory Speed (mph) (desired speed condition) ⁴					
			0	10	20	30	40	50
20	175	5	5	-	-	-	-	-
25	250	5	100	5	-	-	-	-
30	325	100	150	100	-	-	-	-
35	400	150	200	175	5	-	-	-
40	475	225	275	250	175	-	-	-
45	550	300	350	300	250	5	-	-
50	625	375	425	400	325	225	-	-
55	700	450	500	475	400	300	5	-
60	775	550	575	550	500	400	300	-
65	850	650	650	625	575	500	375	-

Notes:

¹ The distances are adjusted for a sign legibility distance of 175 ft, which is the appropriate legibility distance for a 5-in. Series D word legend. The distances may be adjusted by deducting another 100 ft if symbol signs are used. Adjustments may be made for grades if appropriate.

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, Right Lane Ends, etc. The distances are determined by providing the driver a PIEV time of 6.7 to 10.0 seconds plus 4.5 seconds for vehicle maneuvers 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, or Signal Ahead. The distances are based on the 1990 AASHTO policy for stopping sight distance (page 120) providing a PIEV time of 2.5 seconds and friction factor of 0.30 to 0.40 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, or Cross Road. The distance is determined by providing a 1.6 second PIEV time (1990 AASHTO, page 119) a vehicle deceleration rate of 10 ft/second² minus the sign legibility distance of 175 ft.

⁵ No suggested minimum distances are provided for these speeds, as placement location is dependent on site conditions and other signing to provide an adequate advance warning for the driver.

Source: MUTCD.