

April 13, 1994

TRAFFIC ENGINEERING DIRECTIVE
201

SUBJECT: "WARNING SIGN LOCATION AND SIGHT DISTANCE CRITERIA"

The Purpose of this Directive is to establish procedures for measuring sight distance and to establish a criteria for the installation of warning signs.

I. FIELD MEASUREMENT OF EXISTING SIGHT DISTANCE

In accordance with A Policy on Geometric Design of Highways and Streets - 1990, (AASHTO Green Book) by AASHTO, the height of the driver's eye for sight distance determination shall be 3.5 ft. For purposes of determining sight distances at intersections, the height of an object shall be 1.5 to 2.0 ft. which is the assumed height of headlights on a vehicle (sound judgement may warrant the raising of this height up to 4.0 ft. but 1.5 to 2.0 ft. should be the normal figure used.) Sight distance from the side road approach for stop control on the minor road, should be measured from a point 20 feet from the edgeline of the main highway. For further information refer to Chapter 9 of the AASHTO Green Book.

II. ESTABLISHMENT OF MINIMUM SIGHT DISTANCE CRITERIA FOR WARNING SIGNS THAT MAY REQUIRE A FULL STOP.

Warning signs may be installed for intersections or conditions where sight distance in feet is less than 12 times the approach speed in miles per hour. The approach speed is the posted speed limit, advisory speed, or a value judged to most accurately represent the prevailing speed at a given location. For special situations involving four lane highways or large trucks refer to Figure IX-39 of the AASHTO Green Book.

III. ESTABLISHMENT OF MINIMUM SIGHT DISTANCE FOR DRIVEWAY APPROACHES

Minimum sight distance shall be in accordance with existing Tables on p. 17 of the Driveway Manual (attached). The approach speed is to be considered the posted speed limit, the posted advisory speed or a value judged to most accurately represent the prevailing speed at a given location.

IV. LOCATION OF WARNING SIGNS

After it has been determined that a warning sign is needed, the placement of the sign shall be in accordance with Table II-1, of the MUTCD (attached).

This table includes placement distance for conditions A, B, and C. Condition A involves signing for lane changing, passing, or merging such as MERGING TRAFFIC or RIGHT LANE ENDS signs. Condition B involves the placement of Warning Signs that may require a full stop such as STOP AHEAD, SIDE ROAD WARNING or FIRE STATION. Condition C involves a deceleration condition such as a curve sign with an advisory speed plaque.

William L. Wilshire, Jr.
Acting Director - Traffic Engineering Division

Table 2a. Safe Stopping Sight Distances Required at Different Operating Speeds on Upgrades.

Design Speed (mph)	Stopping Sight Distance (ft)			
	0%	Upgrades		
		3%	6%	9%
15	80	75	74	73
20	115	109	107	104
25	155	147	143	140
30	200	200	184	179
35	250	237	229	222
40	305	289	278	269
45	360	344	331	320
50	425	405	388	375
55	495	469	450	433
60	570	538	515	495
65	645	612	584	561
70	730	690	658	631
75	820	772	736	704
80	910	859	817	782

Table 2b. Safe Stopping Sight Distances Required at Different Operating Speeds on Downgrades.

Design Speed (mph)	Stopping Sight Distance (ft)			
	Downgrades			
	0%	3%	6%	9%
15	80	80	82	85
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891
75	820	866	927	1003
80	910	965	1035	1121

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

Posted or 85th- Percentile Speed	Advance Placement Distance ¹						
	Condition A: High judgment required ²	Condition B: Stop condition ³	Condition C: Deceleration to the listed advisory speed (mph) for the condition ⁴				
			10	20	30	40	50
20 mph	175 ft	N/A ⁵	N/A ⁵	—	—	—	—
25 mph	250 ft	N/A ⁵	100 ft	N/A ⁵	—	—	—
30 mph	325 ft	100 ft	150 ft	100 ft	—	—	—
35 mph	400 ft	150 ft	200 ft	175 ft	N/A ⁵	—	—
40 mph	475 ft	225 ft	275 ft	250 ft	175 ft	—	—
45 mph	550 ft	300 ft	350 ft	300 ft	250 ft	N/A ⁵	—
50 mph	625 ft	375 ft	425 ft	400 ft	325 ft	225 ft	—
55 mph	700 ft	450 ft	500 ft	475 ft	400 ft	300 ft	N/A ⁵
60 mph	775 ft	550 ft	575 ft	550 ft	500 ft	400 ft	300 ft
65 mph	850 ft	650 ft	650 ft	625 ft	575 ft	500 ft	375 ft

Notes:

¹ The distances are adjusted for a sign legibility distance of 50 m (175 ft) which is the appropriate legibility distance for a 125 mm (5 in) Series D word legend. The distances may be adjusted by deducting another 30 m (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 50 m (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, friction factor of 0.30 to 0.40, minus the sign legibility distance of 50 m (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 3 m/second² (10 ft/second²), minus the sign legibility distance of 50 m (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.