



TRAFFIC AND SAFETY MANUAL

Chapter 2 – Signing 2A – General

Purpose of Signing

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Traffic signs are traffic control devices and are used to promote highway safety and efficiency by providing regulations, warnings, and guidance information for roadway users. Signs do not function alone as an individual sign but function in combination to create a complete signing system.

To be effective a traffic sign should meet five basic principles:

- Fulfill a need,
- Command attention,
- Convey a clear, simple meaning,
- Command respect from road users, and
- Give adequate time for proper response.

Signs should only be used where justified by facts and field studies. Signs are essential where special regulations apply, or where hazards are not self-evident. Signs also provide information for guidance, such as highway routes, directions, destinations, and points of interest.

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TRAFFIC AND SAFETY MANUAL

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Standards and Guidelines-MUTCD

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[The Manual on Uniform Traffic Control Devices](#) (MUTCD) contains the basic principles, guidance and standards that control the use of traffic signs for all streets and highways open to the public. The MUTCD provides standards and guidance on the design, placement, maintenance and uniformity of traffic signs.

The Iowa DOT currently uses the 2009 MUTCD except for exceptions noted in the [Administrative Rule Chapter 761, Section 130.1 \(1\)](#).

Signs should be designed to command attention, provide a clear message, permit adequate time to respond and command respect. The combination of sign size, shape, color, contrast, composition, simplicity of the message, legibility, and uniformity must be used to achieve this goal.

Many traffic signs are a standard shape, size and color and shown in the [“Standard Highway Signs”](#) book. All symbols and colors for signs not shown in the “Standard Highway Signs” book shall follow the procedures for experimentation and change. Word message signs to notify road users of special regulations or to warn road users of a situation that may not be readily apparent may be developed without the need for experimentation.

Uniformity of traffic signs serves many purposes and is important. Uniformity aids in recognition and understanding, reducing perception and reaction times. Uniformity assists the motorists, police officers, and traffic courts by providing a common interpretation to everyone. Uniformity means treating similar situations in a similar manner. The use of uniform traffic signs does not by itself lead to uniformity. The use of a standard traffic sign where it is not appropriate is as much of a problem as the use of a nonstandard sign. This may even be worse as the use of signs where they are not needed may lead to disrespect for those locations where the sign is needed and appropriate.

Part 1 and Part 2A of the MUTCD provide the general standards and guidance for traffic control devices and traffic signs. Part 2 of the MUTCD also shows many typical standard signs approved for use on the highway.

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Types of Signs

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Historically traffic signs have been classified into three types of signs.

- Regulatory signs (MUTCD Section 2B) are used to inform motorists of traffic laws or regulations.
- Warning signs (MUTCD Section 2C) are used to inform motorists of a situation that might not be readily apparent.
- Guide signs (MUTCD Section 2D, 2E & 2F) show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, or cultural information.

Regulatory Signs

Regulatory signs should be used to inform motorists of traffic laws and regulations that are unique to the area or specific to an area and not for common laws or regulations. The signs shall be installed at or near the location where the regulations apply and shall clearly identify the requirements imposed by the regulations.

Most regulatory signs are rectangular, with black, white or red legend on a black, white or red background.

Warning Signs

Warning signs call attention to unexpected conditions on or adjacent to the highway and to conditions that may not be readily apparent. The use of warning signs shall be based on an engineering study or on engineering judgment. The use of warning signs should be kept at a minimum as unnecessary use can tend to lead to disrespect for all signs. If the condition or activity is seasonal or temporary the warning signs should be removed or covered when the condition or activity does not exist.

The MUTCD provides guidance on the use of standard warning signs. Where standard warning signs do not cover the conditions that may be encountered, special message warning signs other than those specified in the MUTCD may be developed and installed.

Guide Signs

Guide signs are essential to direct motorists along the roadway, to inform them of intersecting routes, to direct them to cities, towns, or other major destinations, to identify nearby rivers and streams, parks, forests, and historical sites, and generally to give information that will help them along their way in the most simple, direct manner possible. The development of guide signing is approached on the premise that the signing is primarily for the benefit and direction of road users who are not familiar with the route or area. Guide signs are solely for the purpose of traffic control and are not an advertising medium.

Guide signs are generally white legend on either a green, brown or blue background.

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Installation Guidelines

Originally Issued: 12-17-01, Last Revised: 01-27-04

Introduction

The guidelines contained in sections [2A-7](#), [2A-8](#), [2A-9](#) and [2A-10](#) of the *Traffic and Safety Manual* are intended to give field maintenance personnel the information needed to install and maintain post mounted regulatory, warning and guide signs on the Primary Road System. These guidelines apply to 2 lane routes as well as all Interstate, Freeway and Expressway Routes. Included are sections on post mounting supports, longitudinal location of signs along a roadway, lateral placement of signs, stop sign location, sign mounting height, details on hardware and assembly and sign maintenance.

These guidelines should be used on all Type A sign work on the Primary Road System. The guidelines have been developed to supplement the MUTCD and supersede all previous procedures, instructions, and memorandums relative to sign installation and maintenance. Because of budget and staff limitations, the guidelines do not apply retroactively to signs that were installed in accordance with previous instructions and are otherwise in satisfactory condition.

Disclaimer

The contents of this manual reflect the latest information available concerning sign installation and maintenance. It is the manual holder's responsibility to reconcile any discrepancies with other publications concerning the above-mentioned topics. The State Traffic Engineer will provide assistance at the request of the District Office.

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TRAFFIC AND SAFETY MANUAL

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Mounting Requirements

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Wood Posts

Wood posts for sign installation are available from inventory in two sizes, 4" x 4" and 4"x6". Available lengths are shown in the following table.

<u>Size</u>	<u>Available Lengths</u>
4"x 4"	10', 12', and 14'
4"x 6"	16', 18', 20', 22' and 24'

If posts longer than are available are required for special situations, splicing by overlapping and bolting 2 posts together is permissible. Details on the proper method to splice posts are shown in Figure 4.

In selecting the proper size and number of posts to be used for installing a particular sign, the chart shown in Figure 1 should be used. The scale along the bottom of the chart is the horizontal dimension of the sign given in either inches or feet. In a like manner, the scale along the left edge of the chart is the vertical dimension of the sign. Enter the chart from these 2 points and project lines vertically and horizontally to the point where they intersect. For example, if the sign was 72" wide and 48" high, the resulting point is in the area where 2 – 4"x 6" posts are required. This chart was developed based on the relationships between post combinations and sign area to withstand wind load.

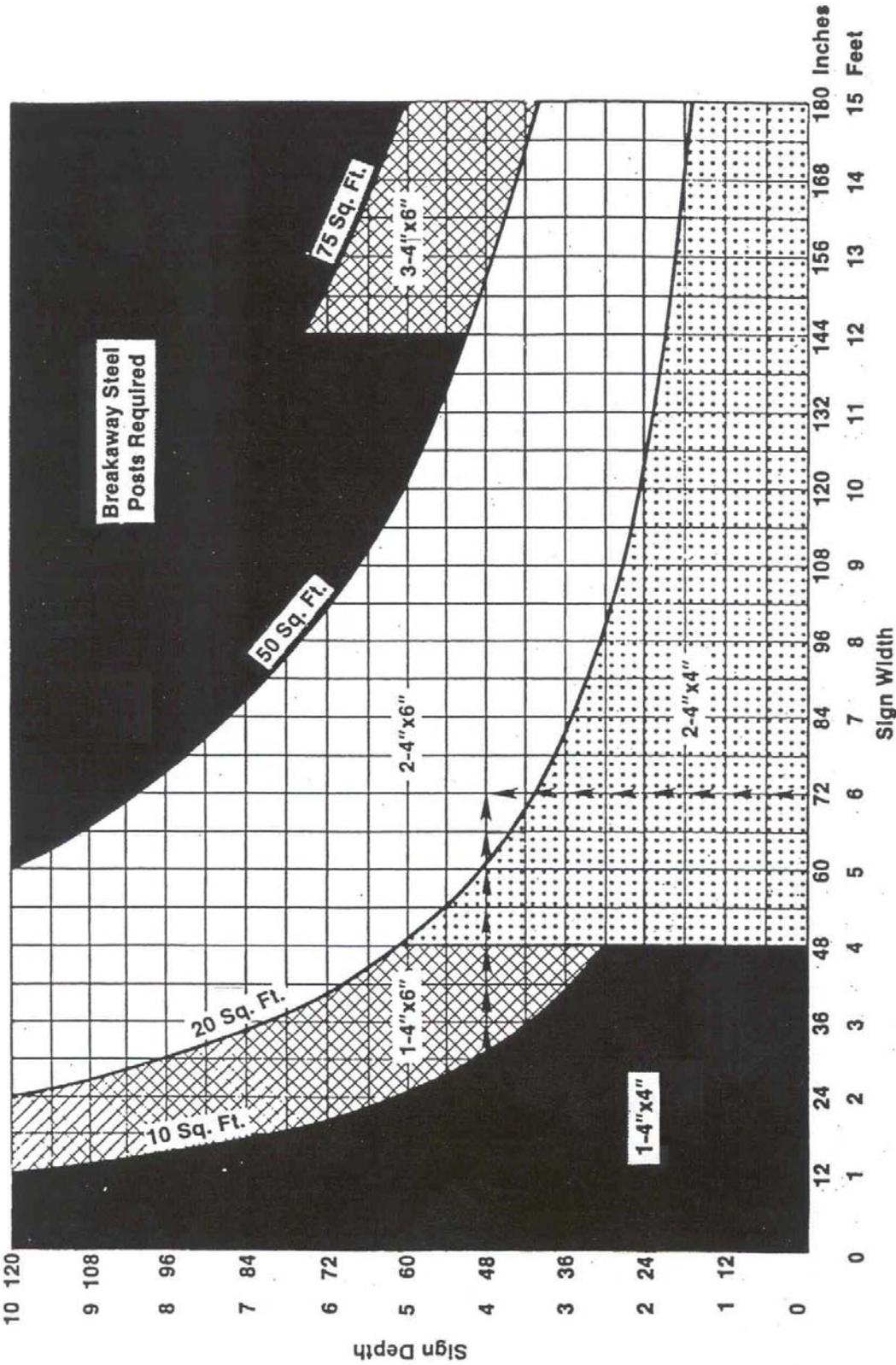


CHART FOR DETERMINATION OF SIGN POST SIZE AND NUMBER

Figure 1

Sign Area

Less Than 10 sq. ft.
10 - 20 sq. ft.
20 - 50 sq. ft.
50 -75 sq. ft.
More Than 75 sq. ft.

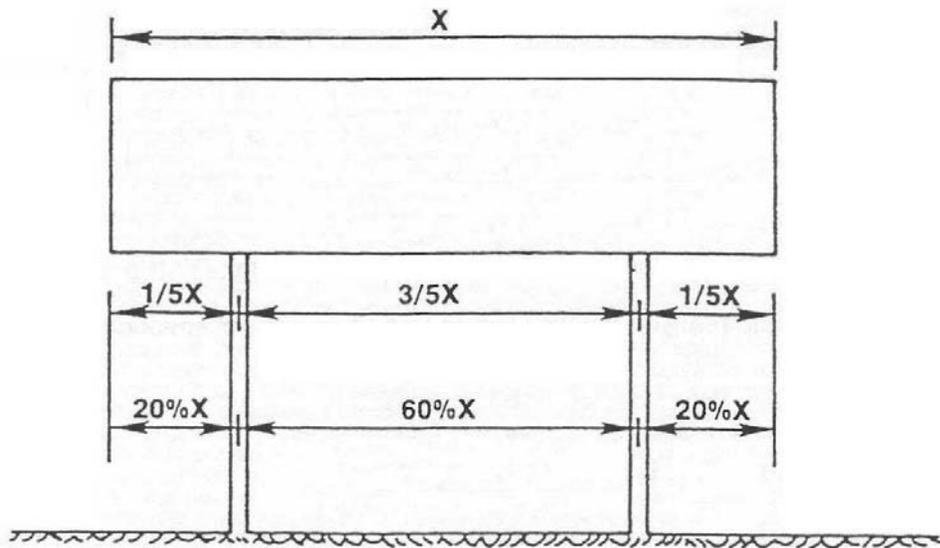
Post Size and Number

1 - 4"x 4" or 2 - 4"x 4"
1 - 4"x 6" or 2 - 4"x 4"
2 - 4"x 6"
3 - 4"x 6"
Steel Posts Required

For sign shapes other than rectangular, use the sign area to determine post requirements. For example, a 48" x 48" diamond shaped warning sign has 16 square feet of area and may be mounted on one 4" x 6" post.

In addition to the area requirements, two other restrictions have been established. They are (1) the maximum width of sign to be installed on a single post assembly is 4 feet for stability reasons and (2) the minimum width of sign to be installed on a 3 post assembly is 12 feet to avoid having more than 2 posts in an 8 foot path for safety reasons. The latter is illustrated and explained in more detail in the following paragraphs.

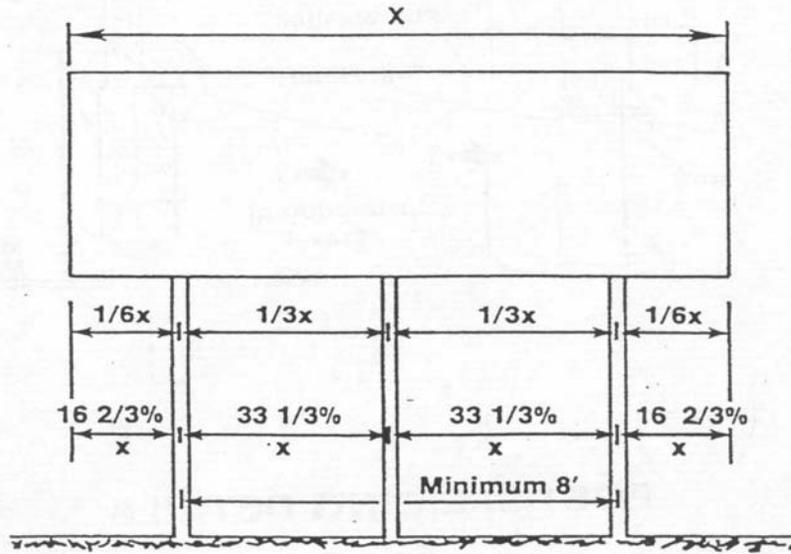
For 2 post assemblies, Figure 2 shows the horizontal spacing of posts to be used for proper support and appearance. The distance from the outside edge of the sign to the center of each post should be 20 % or 1/5 of the sign width. The distance between the posts should be 60 % or 3/5 of the sign width.



TYPICAL 2 POST ASSEMBLY

Figure 2

For 3 post assemblies, Figure 3 shows the horizontal spacing of posts to be used for proper support, appearance and safety. The distance from the outside edge of the sign to the center of each exterior post should be 16 2/3 % or 1/6 of the sign width. The distance between posts should be 33 1/3 % or 1/3 of the sign width. For safety reasons, the distance between the centers of the exterior posts on a 3-post assembly should not be less than 8 feet. In other words, there should not be more than 2 posts installed in an 8-foot path. This requirement limits the minimum width of sign for a 3-post assembly to 12 feet.

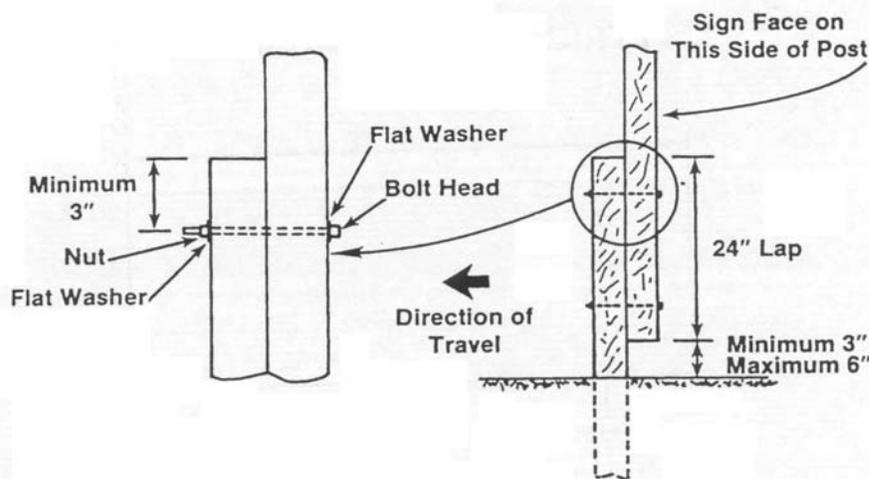


TYPICAL 3 POST ASSEMBLY

Figure 3.

Posts for smaller signs with less than 10 sq. ft. of area should be installed with approximately 4 feet below the ground surface. For larger signs and longer post lengths, the portion below the ground surface should be a minimum of 5 feet. Postholes should be backfilled with suitable soil tamped in place. In cases where the soil is unsuitable, crushed rock or crushed concrete should be used. Care should be taken in the process to see that the posts are plumb, insofar as possible, at all times. If properly placed, posts should remain firmly in position without needing further attention.

Figure 4 shows details for splicing signposts.



POST SPLICING DETAILS

Figure 4

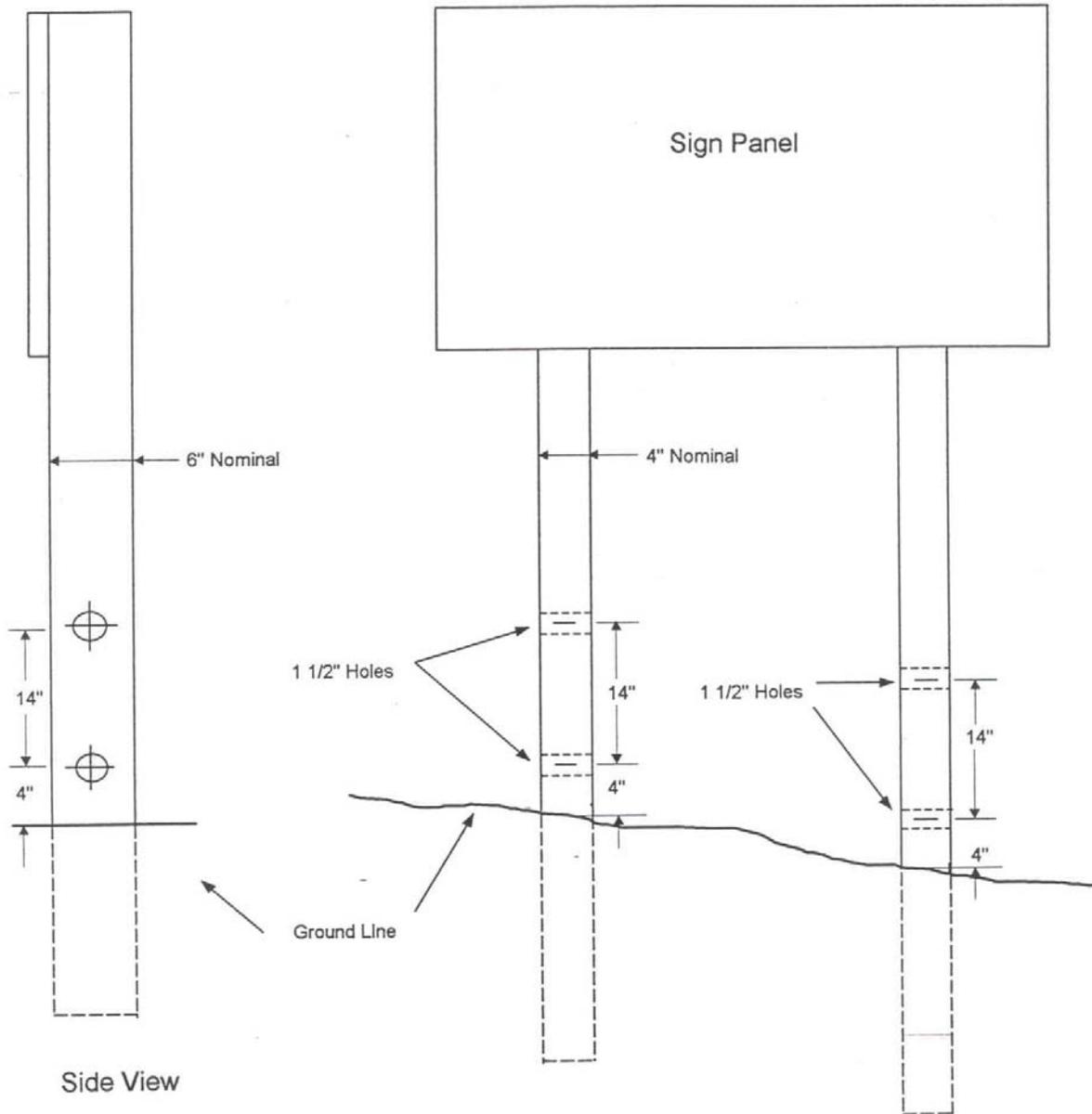
Post splices should be made just above the ground surface to allow the breakaway features to function properly. No part of the splice is to be placed below the ground surface. The

splice is to be made in the direction of traffic with the upper post on the front and the lower post on the back. The distance from the bottom of the splice to the ground should be not less than 3” or more than 6”. The overlap should be 24” using at least two bolts to fasten the posts together. Flat washers are to be placed at both ends of the bolt.

Angle bracing on the backside of a sign may be used as an interim solution in unusual circumstances where wind load, soil condition and post length will not hold a normal installation in place. Post material no larger than 4” x 4” should be used for the brace. The supplemental post at the bottom of the brace should be placed 12-15 feet from the sign and should not project more than 12” above the ground surface. The top end of the brace should be fastened to the sign post at least 7 feet above the ground surface at the sign. Bracing should be used only where absolutely necessary. For large signs requiring braces for stability, a permanent more suitable solution such as steel breakaway sign supports installed by contract should be used. Interim bracing should be reviewed and approved by the state traffic engineer prior to use.

Breakaway Standards for 4 x 6 Wood Posts

Based on crash tests all new 4” x 6” wood posts shall be modified to meet breakaway standards by drilling two holes near the bottom portion of the post. This modification is not retroactive. See Figure 5, Typical Modification for Wood 4” x 6” Sign Posts, for details.



All 4"x6" wood posts shall be modified by having two 1-1/2" diameter holes drilled perpendicular to the roadway centerline.

Front View

Typical Modification for Wood 4"x6" Sign Posts

Figure 5

Multiple Posts

For those signs being supported by three or more posts, any two adjacent posts cannot be closer than 4 feet, center-to-center. If they are closer, the posts will not break as intended. These spacing requirements also apply to individual signs on separate posts mounted side by side such as multiple route shields.

Square Tubular Steel Posts

Square tube steel posts are available for use where the added original expense is justified. They shall be installed in compliance with current manufacturer's recommendations. An example of one of the manufacturer's post sizing charts is shown in Table 1. Additional charts are available from the manufacturer. Not all of the post sizes shown in Table 1 are available through the Department's warehouse. It may be necessary to purchase non-stocked sizes directly from the manufacturer. If any splices are to be used, they should be located at least 3 feet above the ground. Alternative methods may be used as approved by the Office of Traffic and Safety.

SINGLE POSTS WIND SPEED 80 MPH

12 GA. PERFORATED SQUARE POSTS
POSTS STRESSED UP TO 60,000 PSI (MIN. YIELD)

SIGN SIZE (INCHES)			HEIGHT TO BOTTOM OF SIGN (FEET)					
WIDTH	X	HEIGHT	5	6	7	8	9	10
12	X	12	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
12	X	18	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
12	X	24	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 3/4
12	X	30	1 1/2	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4
12	X	36	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4	2
12	X	48	1 3/4	1 3/4	1 3/4	2	2	2
18	X	12	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
18	X	18	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 3/4
18	X	24	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4
18	X	30	1 1/2	1 1/2	1 3/4	1 3/4	2	2
18	X	36	1 3/4	1 3/4	1 3/4	2	2	2
18	X	48	1 3/4	2	2	2 1/4	2 1/4	2 1/4
24	X	12	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 3/4
24	X	18	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4
24	X	24	1 1/2	1 1/2	1 3/4	1 3/4	2	2
24	X	30	1 3/4	1 3/4	1 3/4	2	2	2 1/4
24	X	36	1 3/4	2	2	2	2 1/4	2 1/4
24	X	48	2	2 1/4	2 1/4	2 1/2	2 1/2	2 1/2
30	X	12	1 1/2	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4
30	X	18	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4	2
30	X	24	1 1/2	1 3/4	1 3/4	2	2	2
30	X	30	1 3/4	1 3/4	2	2	2 1/4	2 1/4
30	X	36	2	2	2 1/4	2 1/4	2 1/4	2 1/2
30	X	48	2 1/4	2 1/4	2 1/2	2 1/2	A	A
36	X	12	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4
36	X	18	1 1/2	1 3/4	1 3/4	1 3/4	2	2
36	X	24	1 3/4	1 3/4	2	2	2 1/4	2 1/4
36	X	30	1 3/4	2	2	2 1/4	2 1/4	2 1/2
36	X	36	2	2 1/4	2 1/4	2 1/4	2 1/2	2 1/2
36	X	48	2 1/4	2 1/2	2 1/2	A	B	C
42	X	12	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4	2
42	X	18	1 3/4	1 3/4	1 3/4	2	2	2 1/4
42	X	24	1 3/4	2	2	2 1/4	2 1/4	2 1/2
42	X	30	2	2	2 1/4	2 1/4	2 1/2	2 1/2
42	X	36	2 1/4	2 1/4	2 1/2	2 1/2	A	A
42	X	48	2 1/2	2 1/2	A	B	C	C
48	X	12	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4	2
48	X	18	1 3/4	1 3/4	2	2	2 1/4	2 1/4
48	X	24	2	2	2 1/4	2 1/4	2 1/2	2 1/2
48	X	30	2	2 1/4	2 1/4	2 1/2	2 1/2	A
48	X	36	2 1/4	2 1/2	2 1/2	A	A	B
48	X	48	2 1/2	A	B	C	C	C

NOTE: ALL POSTS ARE 12 GA. EXCEPT AS NOTED BELOW
A - 2 1/2 SQ. TUBE 10 GA. PERFORATED
B - COMBINE 2 AND 2 1/4 TUBES 12 GA. WITH SLIP BASE
C - COMBINE 2 1/4 AND 2 1/2 TUBES 12 GA. WITH SLIP BASE
D - COMBINE 2 3/16 AND 2 1/2 TUBES 10 GA. WITH SLIP BASE
DESIGN CRITERIA: MAXIMUM STRESS = 60000 PSI

Use the standard size from the chart if it is stocked standard size. Otherwise use the next larger stocked standard size.

For other sizes and wind load ratings including double and triple post sizes, contact Tim Sothmann Republic Companies at : 800-397-6204

Table 1: Square Tubular Steel Posts Sizing Chart

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Sign Placement

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Signs should be located on the right side of the roadway where they are easily recognized and understood by road users. Signs in other locations should be considered only as supplementary to signs in the normal locations, except as otherwise indicated in the Traffic and Safety Manual or the Manual on Uniform Traffic Control Devices (MUTCD). Supplementary warning signs are used on the left of the roadway on multilane divided roads since traffic in the right lane might obstruct the view to the right.

Signs should be individually installed on separate posts or mountings except where one sign supplements another or where route or directional signs must be grouped. Where space is limited, certain signs may be mounted together or omitted. The State Traffic Engineer will provide assistance for individual cases at the request of the District Office.

Longitudinal Placement

The locations of some signs are fixed such as points where speed limits change, no passing zones begin, corporate limits cross a primary road and at intersections. A reasonable amount of flexibility is afforded in the location of many other warning and guide signs. When selecting locations, surrounding features and terrain should be carefully examined.

First, the roadway cross section should be considered. Select a location where the sign can be offset the desired distance without encountering a severe fill section requiring long posts or a cut section where the sign cannot be offset at the proper mounting height. If available, a relatively level section is preferred. Locations behind existing guardrails or barriers should be considered to take advantage of protected areas.

Next, check to see if there are physical features that may obstruct visibility of the sign. Examples are trees, mailboxes, vertical or horizontal curves, utility or luminaire poles, bridge piers and abutments and other essential signs. Locations must be adjusted to points where these features are not obstructions. In some cases, it may be necessary to clear obstructions.

Care should be taken to see that the shape or outline of a sign is not obscured when mounting signs back to back. Do Not Enter and Wrong Way signs at interchange ramps may be mounted on the back of Stop and Destination signs respectively if this does not obscure the outline of the signs. For most other back-to-back locations, signs should be located on separate posts at a minimum of 50-foot spacing.

Normally, the minimum longitudinal spacing of signs is 300 feet on two-lane and four-lane undivided roadways and 800 feet for four-lane divided roadways. At intersections and in urban areas where room is limited, it may be necessary to reduce spacing. In sections with reduced speed limits, spacing of five times the posted speed limit is desirable, but conditions may limit spacing to as little as three times the posted speed limit. Uniform spacing enhances the effectiveness of a series of signs. Where practical, the typical spacing for Interstate and Freeway Routes should be 1000 feet or more. Spacing is important to allow signs to be viewed without obstructing one another and to allow the motorist time to read and understand the message conveyed before encountering another sign.

Since warning signs are primarily for the benefit of the driver who is unacquainted with the road, it is very important that care be given to the placement of such signs. Warning signs should provide adequate time for the driver to perceive, identify, decide, and perform any necessary maneuver. This total time 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 a decision, and is here referred to as the PIEV time. The PIEV time can vary from about 3 seconds for general warning signs to 10 seconds for high driver judgment condition warning signs. Table 1 lists suggested minimum sign placement distances that may be used for three conditions.

Condition A is a high driver judgment condition which requires the driver to use extra time in making and executing a decision because of a complex driving situation such as lane changing, passing or merging. Typical signs are Merge, Lane Reduction, Added Lane, Right Lane Ends, and Divided Road Ends. **Condition B** is a condition in which the driver will likely be required to stop. Typical signs are Stop Ahead, Signal Ahead and Low Clearance. **Condition C** is a condition in which the driver will likely be required to decelerate to a specific speed. Typical signs are Turn, Curve, Bump, Dip and Cross Road. Table 1 is provided as an aid for determining warning sign locations. The values contained in the table are for guidance purposes and should be applied with engineering judgment.

Table 1

Guidelines for Advance Placement of Warning Signs

Posted or 85th percentile speed MPH (use higher speed)	Suggested Minimum Placement Distance (Feet) (1) (2)							
	Condition A high judgment needed (10 Secs. PIEV)	Condition B STOP condition	General Warning Signs					
			Condition C Deceleration conditions to listed advisory speed or desired speed at condition (MPH)					
			10	20	30	40	50	
20	175	-(3)	-(3)					
25	250	-(3)	100	-(3)				
30	325	100	150	100				
35	400	150	200	175	-(3)			
40	475	225	275	250	175			
45	550	300	350	300	250	-(3)		
50	625	375	425	400	325	225		
55	700	450	500	475	400	300	-(3)	
60	775	550	575	550	500	400	300	
65	850	650	650	625	575	500	375	

Notes:

(1) To determine the advance placement distance, enter the table at the left using the approach speed, select the condition which applies, (A, B, or C) and read the distance in the column below.

(2) Distance provides for a 3-second PIEV, 175 feet Sign Legibility Distance, Braking Distance for Condition B and Comfortable Braking Distance for Condition C.

(3) No suggested minimum distance provided. At these speeds, sign location depends on physical conditions at the site.

Other miscellaneous warning signs that advise of potential hazards not related to a specific location may be installed in the most appropriate locations since they are not covered in Table 1. These include Deer Crossing and Soft Shoulder signs for example.

Lateral Placement

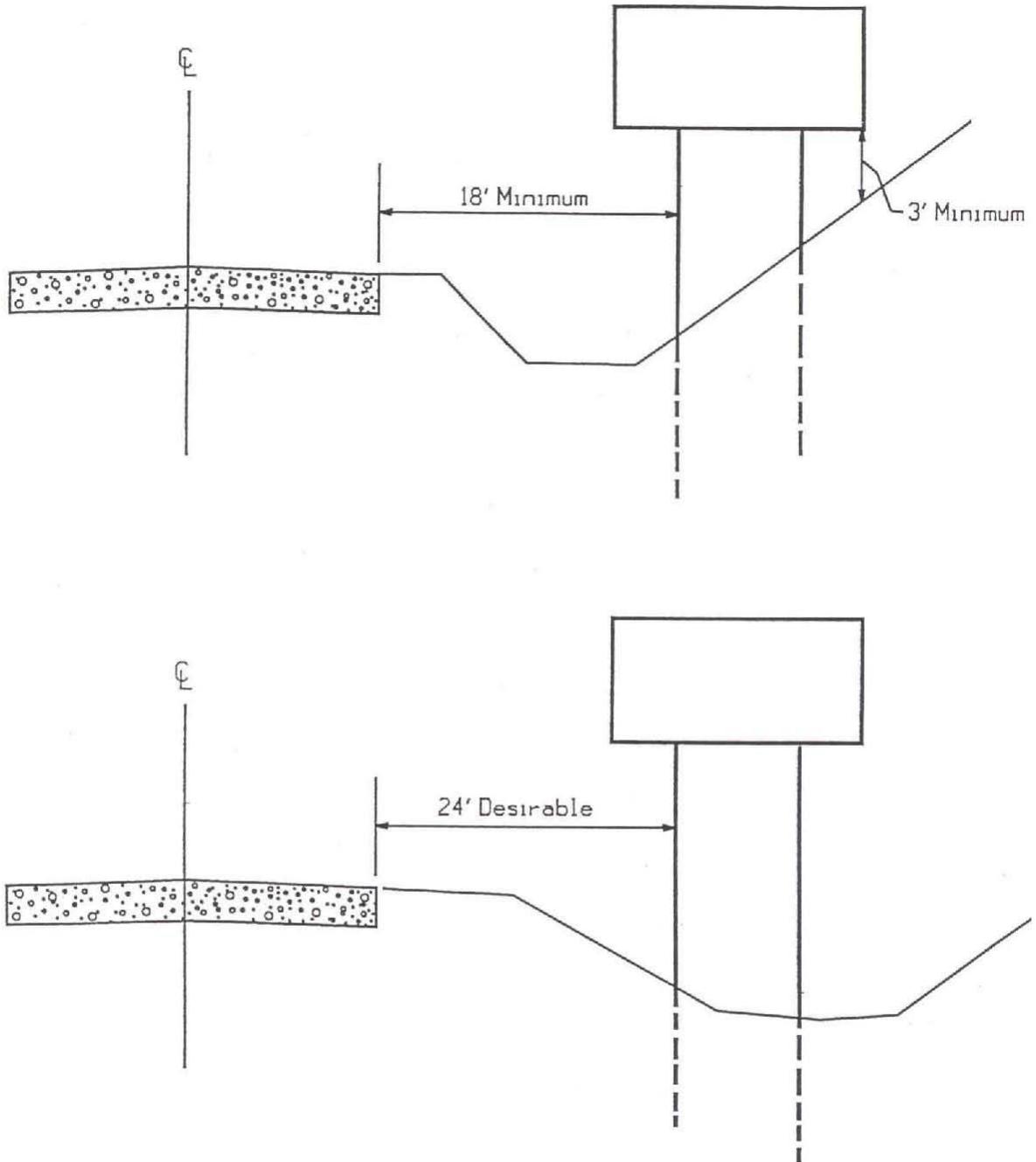
Signs on all newly constructed highways are to be offset from the traveled way if practical. This concept is to be extended to all signs that are replaced or are otherwise in need of attention by maintenance personnel.

The shape of the cross section, available right of way, maximum length of posts available and condition of the soil to resist wind load, control the permissible offset. Good signing practice requires that signs be at least 6 feet from the edge of the shoulder and at least 12 feet from the edge of the traveled way. Taking into consideration all of the above factors, offsets prescribed below should be used for all signs in rural areas except those in special categories covered later in this section.

<u>Type of Offset</u>	<u>Distance from Edge of Pavement to Near Post</u>
Minimum	18 feet
Desirable	24 feet

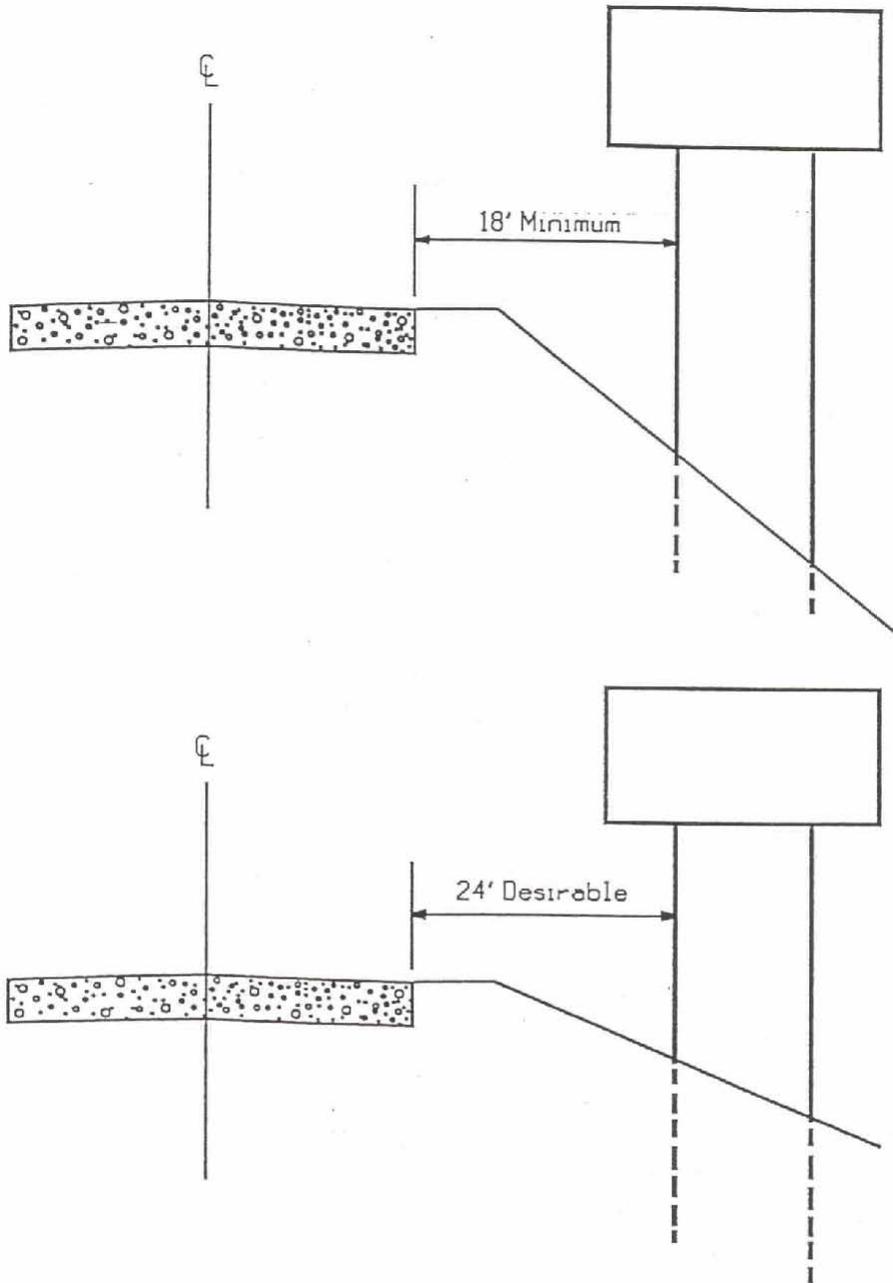
Offsets should be measured from the edge of the pavement in all cases, regardless of the shoulder width. The offset distances are to the post for a single support assembly or the near post for a multiple support assembly. Although the near edge of the sign projects closer to the roadway, offset distances will provide more than the minimum distances prescribed in the Manual on Uniform Traffic Control Devices.

Depending on shoulder width these offsets will result in approximately 12 feet of clearance from the edge of the shoulder to the near edge of the sign. A distance of approximately 14 feet is provided from the shoulder edge to the signpost to provide a recovery area for errant vehicles, to allow for mowing and snow plowing, and to keep the signs cleaner. Figures 1 and 2 show typical minimum and desirable sign offsets for cut and fill sections in rural areas.



SIGN OFFSETS IN CUT AREAS

Figure 1



SIGN OFFSETS IN FILL AREAS

Figure 2

The desirable 24-foot offset (from the pavement) should be used in most normal cases. Where site conditions do not permit this offset, the 18-foot minimum may be used. It is recognized that there may be unusual circumstances where these distances cannot be attained. For special cases, the near edge of the sign should be installed not less than 6 feet from the edge of the shoulder.

In urban areas, signs may be installed on existing utility and light poles when space for installing posts is otherwise not available. Permission should be obtained from the owner before installing signs. A minimum offset of 2 feet from the face of the curb to the near edge of the sign should be maintained if practical.

On Interstate, Freeway, and Expressway routes, large guide signs are normally installed between 30 and 60 feet measured from the edge of pavement to the near edge of the sign. In most cases, large guide signs are mounted on permanent steel breakaway supports because the sign area is too large for wood supports.

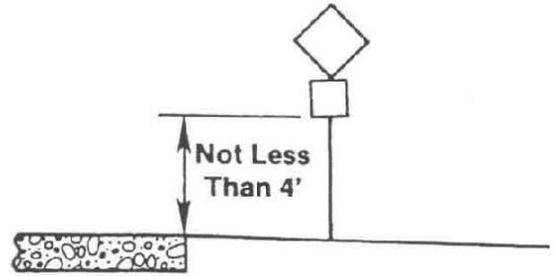
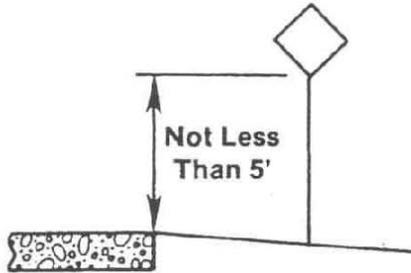
MOUNTING HEIGHT

On two-lane routes in rural areas, the Manual on Uniform Traffic Control Devices specifies that signs be mounted at a height of at least 5 feet measured from the bottom of the sign to the near edge of the pavement. In areas where parking or pedestrian movements are likely to occur or where there are other obstructions to view, the clearance from the bottom of the sign to the curb or ground at the base of the sign shall be at least 7 feet. When a secondary sign is mounted below another sign, the mounting heights prescribed above may be reduced to 4 feet and 6 feet respectively. The above mounting heights are illustrated in Figure 3. For the purpose of this section, a route sign assembly is treated as a single sign.

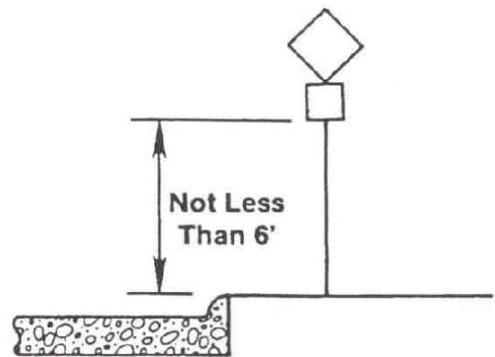
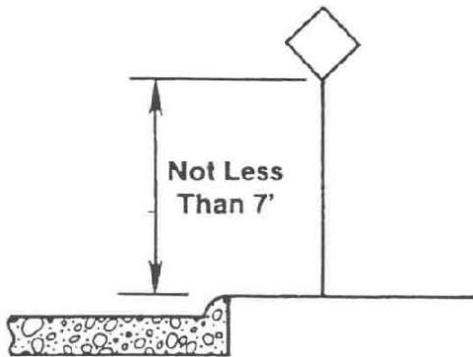
The sign mounting height requirements for ground installations on Interstate, Freeway and Expressway routes vary somewhat from those on conventional highways and streets. Directional signs should be mounted at a height of at least 7 feet measured from the level of the near edge of the pavement to the bottom of the sign. If a secondary sign is mounted below another sign, the major sign shall be at least 8 feet and the secondary sign at least 5 feet above the level of the pavement edge. All route signs, warning signs and regulatory signs shall be at least 7 feet above the near edge of the pavement. Where larger guide signs are placed 30 feet or more from the edge of the nearest traffic lane, the height from the bottom of the sign to the near edge of pavement may be 5 feet. The above requirements for signs installed on Interstate, Freeway and Expressway Routes including crossovers, intersections, and interchanges, are illustrated in Figure 4.

It is recognized that signs cannot be installed precisely at the above stated heights, therefore a mounting tolerance of 6 inches is allowed. The above mounting heights are considered minimums. As an example, the permissible range in mounting height for a rural area would be from 5 feet, 0 inches to 5 feet, 6 inches.

RURAL AREAS

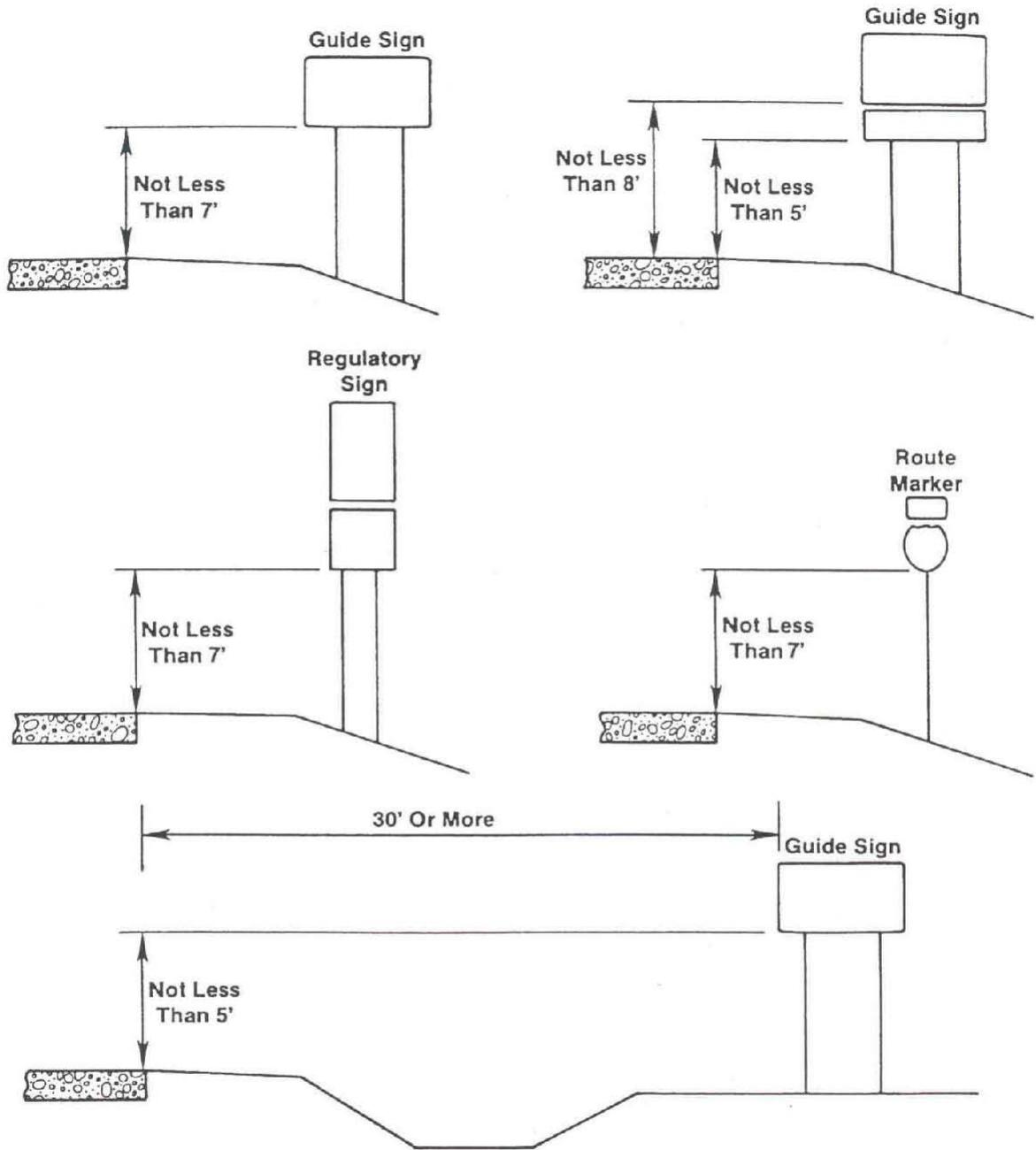


URBAN AREAS



Sign Mounting Heights
(Except for Freeways & Expressways)

Figure 3



Sign Mounting Heights
Freeways & Expressways

Figure 4

Stop Sign Placement

The location of stop signs is important; therefore this section of the guidelines is to provide specific directions on their placement.

Stop signs shall be located as close as practical to the intersection it regulates while optimizing its visibility to the road user it is intended to regulate. Stop signs do not necessarily need to be placed immediately adjacent to the painted stop bar. The MUTCD suggests that stop signs be located a maximum of 50 feet from the edge of the intersected street or highway. In areas where there are no curbs, the lateral clearance should be no closer than 6 feet from the edge of a usable shoulder. If a usable shoulder is nonexistent, the lateral clearance should be no closer than 12 feet from the edge of the traveled way. These offset distances are illustrated in Figure 5, Figure 6, Figure 7, and Figure 8 illustrate stop sign locations where there is a shoulder (Case A), where there is no shoulder (Case B) and where there is an island (Case C), respectively. Stop signs should be confined to the shaded areas, but as close to the approach roadway as possible to provide the motorist with the best visual impact. If the stop sign located as described above is considered marginal or unsatisfactory, consideration should be given to adding a stop sign barrel or island, provided ample space is available within the intersection. The barrel or island should be offset a minimum of 2 feet from the edge of the approach roadway and full shoulder width plus 2 feet from the through roadway. Also, the width of the turning roadway should be ample to accommodate the classes of vehicles using the intersection. A barrel may be used on a temporary basis.

In urban areas, stop signs should be placed a minimum of 6 feet from the near edge of the intersected street or a minimum of 4 feet in advance of the near edge of a marked crosswalk. Lateral clearance may be reduced to a minimum of 2 feet from the face of a curb. This minimum offset would also apply where stop signs are placed in medians or channelizing islands.

Where only one stop sign is used, it shall be located on the right side of the approach traffic lane. Where the approach roadway consists of two lanes of traffic, a second stop sign should be placed where it is visible to traffic in the inner lane if a suitable location exists. At channelized intersections, the additional stop sign may be placed on a channelizing island or median.

Yield Sign Placement

Yield signs are used as described in [Section 2B-2](#) of the Traffic and Safety Manual. When used at interchanges they should be placed as described below and shown in Figure 9.

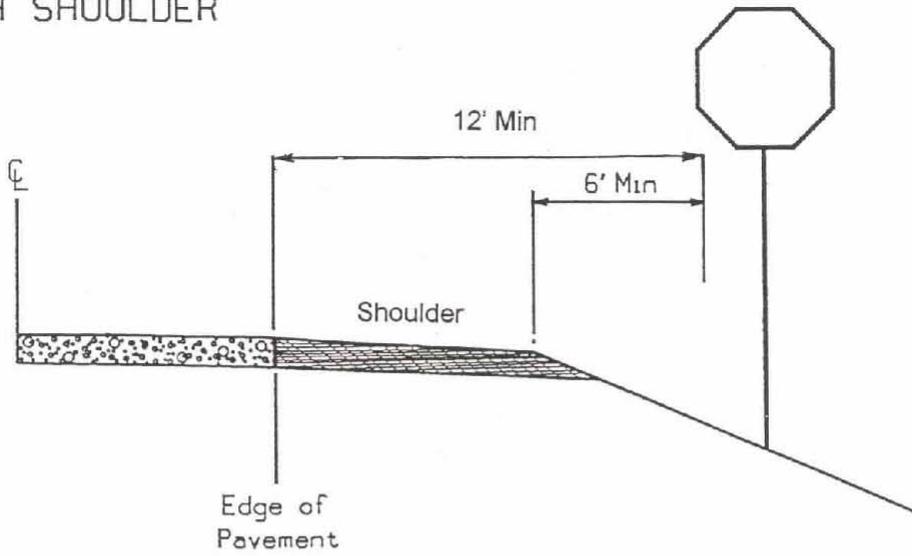
Yield signs should be placed on parallel acceleration lanes less than 1,300 feet in length, measured from the point of compound curvature (PCC) on the ramp where the driver can begin to accelerate, to the beginning of the lane drop taper.

Yield signs should be placed on tapered acceleration lanes less than 300 feet in length, measured from the point of tangency (PT) of the ramp entrance curve to the point at which the taper pavement is 12 feet wide.

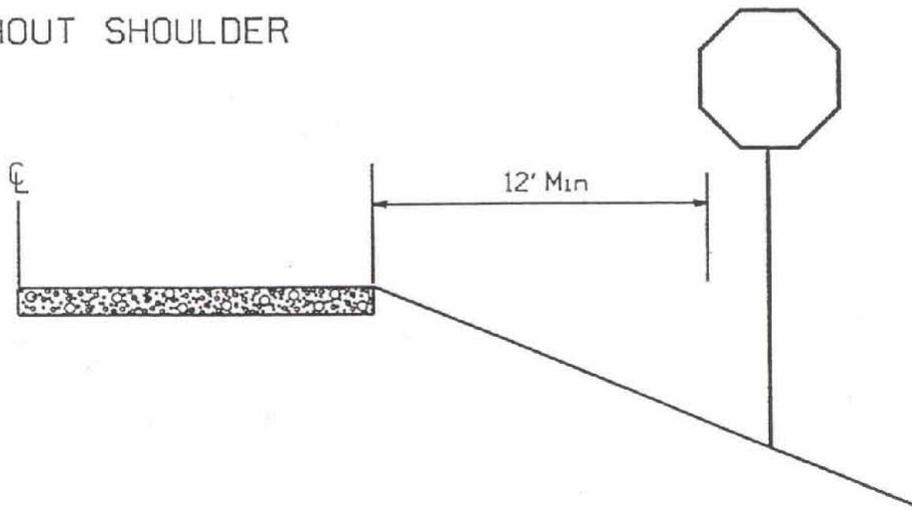
When used on an entrance ramp with a tapered acceleration lane, the Yield sign should be placed at the point where the taper pavement is twelve feet wide. When used on an entrance ramp with a parallel acceleration lane, the Yield sign should be placed at the beginning of the lane drop taper.

At locations where a parallel acceleration lane does not extend beyond a nearby exit ramp the sign should be placed on the entrance ramp near the parallel acceleration lane.

WITH SHOULDER



WITHOUT SHOULDER



LATERAL PLACEMENT OF STOP SIGNS

Figure 5

**CASE "A"
WITH SHOULDER**

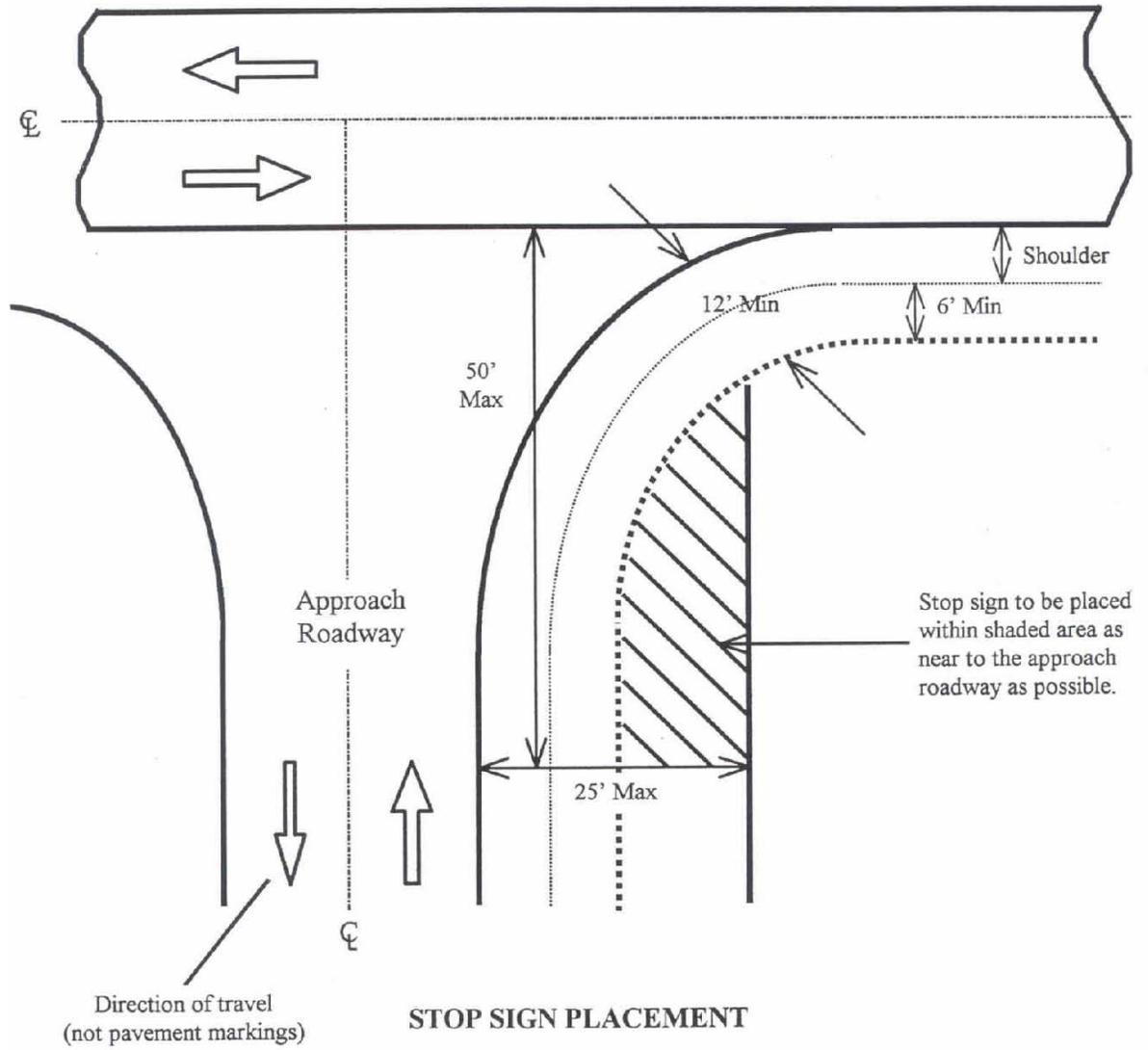


Figure 6

**CASE "B"
WITHOUT SHOULDER**

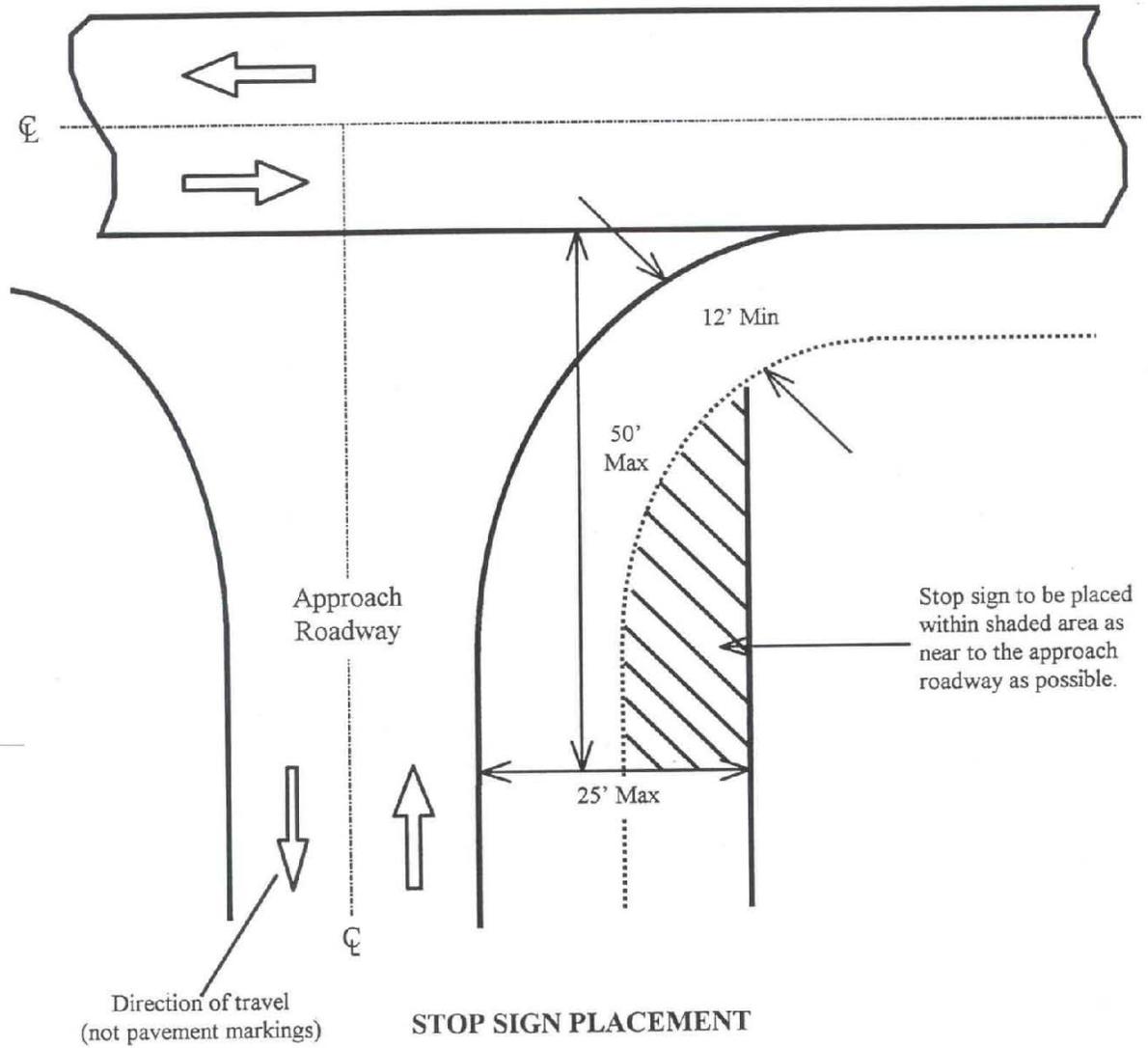


Figure 7

**CASE "C"
WITH ISLAND**

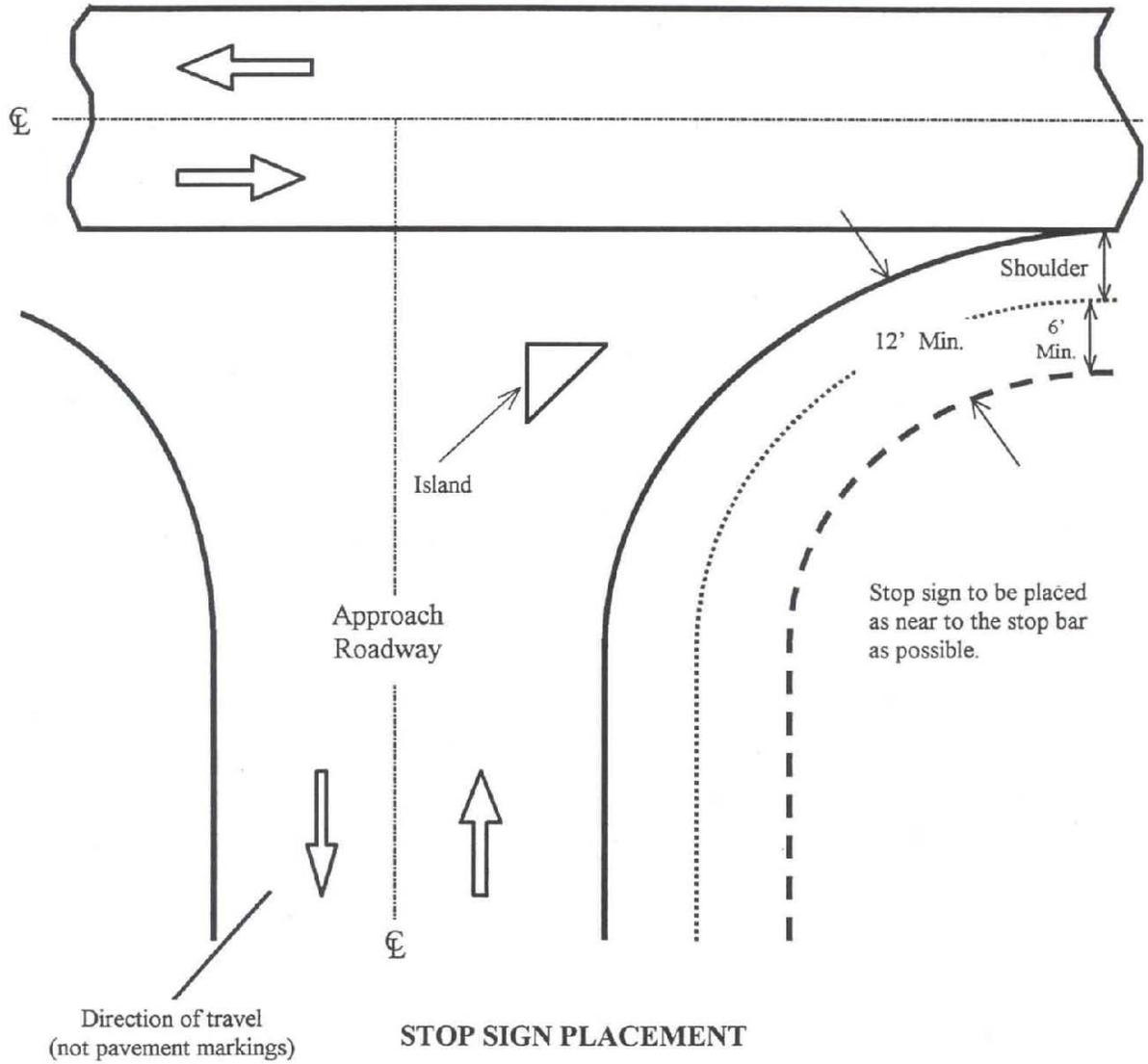
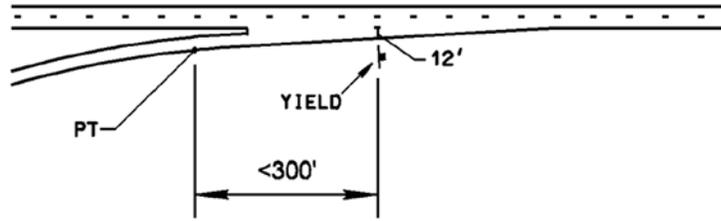
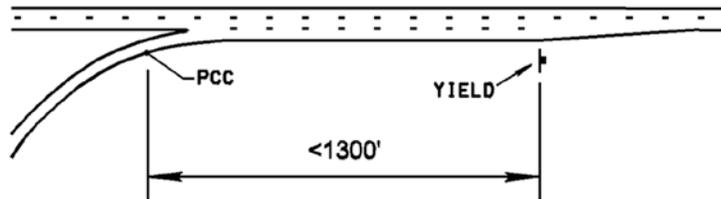


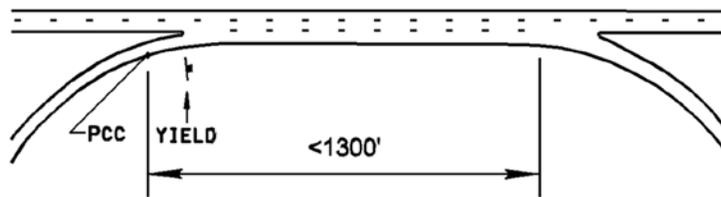
Figure 8



On Tapered Acceleration Lane



On Parallel Acceleration Lane With Lane Drop Taper



At Parallel Acceleration Lane Ending at Exit Ramp

Typical Yield Sign Placement at Interchanges
Figure 9

Speed Reduction Sign Placement

A Speed Reduction sign is to be used when a reduction is made from a speed zone of 55 mph or higher. For a speed limit of 55 mph, it is placed at the distance in advance of the lower speed zone shown in Table 2. For a speed reduction from a speed zone of less than 55 mph, a Speed Reduction sign may be used as authorized by the Office of Traffic and Safety. For a reduction from a speed greater than 55 mph, the Speed Reduction sign is to be placed 800 feet in advance of the lower limit.

Table 2

**Distance From Speed Reduction Sign In 55 mph Zone
To Speed Limit Sign**

Posted Speed Limit mph	Distance To Speed Reduction Sign (feet)
25	1200
30	1000
35	800
40	600
45	450
50	300

Speed Limit Sign Placement

Speed Limit signs should be placed at the following locations:

1. As nearly as practical to the location of a change in the speed limit as described in the Commission Order or Staff Action.
2. Just beyond major street intersections and at intervals of about three blocks in cities.
3. At the corporate limits line for traffic leaving the city, except for Freeways.
4. On primary highways for traffic exiting a higher speed highway at an interchange.
5. Beyond interchanges at the standard location of 1500 feet beyond entrance ramp tapers.
6. On rural highways with speed limits less than 55 mph, just beyond each intersection with a paved side road and at intervals not to exceed two miles.
7. On highways with speed limits of 65 mph, just beyond each intersection with a paved side road.
8. On multilane divided highways with speed limits of 55 mph, just beyond each paved side road and at intervals not to exceed two miles.

In rural areas with closely spaced intersections with paved side roads it is not necessary to have speed limit signs at each of them as long as the minimum spacing is approximately one mile.

Route Sign Assemblies

A route sign assembly consists of a route sign and auxiliary signs that further identify the route and indicate the direction. Route sign assemblies are used at the beginning of routes, end of routes, at route turns, at junctions and at intervals between signed intersections. If engineering

judgment indicates that groups of assemblies that include overlapping routes or multiple turns might be confusing, route signs or auxiliary signs may be omitted or combined, provided that clear directions are given to road users.

The beginning of a route shall be marked by an assembly that includes a Cardinal Direction auxiliary sign above a route sign. The end of a route shall be marked by an assembly that includes an End auxiliary sign above a route sign.

Placement of route sign assemblies is shown Figures 1, 2, 3, 4, 5, 6 and 7 of [Section 2A-10](#) of the Traffic and Safety Manual.

Junction Assembly

A Junction assembly consists of a Junction auxiliary sign and a route sign. The route sign shall carry the number of the intersected or joined route. The Junction assembly shall be installed in advance of an intersection where a numbered route is intersected or joined by another numbered route.

Advance Route Turn Assembly

An Advance Route Turn assembly consists of a route sign and an Advance Turn Arrow or word message auxiliary sign. It shall be placed in advance of an intersection where a turn must be made to remain on the indicated route. It is also placed between the junction assembly and the directional assembly to supplement the junction assembly in advance of intersecting routes. Where a multi-lane highway approaches an interchange or intersection with a numbered route, the word message auxiliary sign, Left Lane or Right Lane, should be used to pre-position turning vehicles in the correct lane from which to make their turn.

Directional Assembly

A Directional assembly consists of a route sign and a Directional Arrow auxiliary sign. It shall be used to mark turn movements previously indicated by an Advance Route Turn assembly or a Junction assembly.

Confirming Assembly

A Confirming assembly consists of a Cardinal Direction auxiliary sign and a route sign. It shall be erected just beyond primary-to-primary intersections of numbered routes to inform motorists of the route they have turned onto.

Reassurance Assembly

A Reassurance assembly consists of a Cardinal Direction auxiliary sign and a route sign. Reassurance assemblies should be spaced at such intervals as necessary to keep drivers informed of their route. In urban areas Reassurance assemblies should be erected just beyond major intersections and at intervals of about three city blocks.

For the benefit of traffic entering from paved secondary routes, Reassurance assemblies for the primary route shall be placed for both directions of traffic. They should also be placed at unpaved intersections on alternating sides of the primary highway. However, in areas with closely spaced intersections it is not necessary to have reassurance assemblies at each of them as long as the minimum spacing is approximately one mile. Reassurance assemblies are also used in the series of signs at corporate limits as shown in Figure 6 of [Section 2A-10](#) of the Traffic and Safety Manual.

Signing for Climbing Lane

Signing for climbing lanes consists of a Slower Traffic Keep Right sign placed 600 feet in advance of the climbing lane taper and at certain locations along the climbing lane, a No Passing

Zone warning sign at the taper point and typical Lane Ends warning signing. Required signing for climbing lanes is shown in Figure 7 of [Section 3B-2](#) of the Traffic and Safety Manual.

Signing for Passing Lane

Signing for passing lanes constructed at strategic locations along a normal two-lane highway consists of a regulatory Passing Lane 2 Miles Ahead sign, a No Passing Zone warning sign at the taper point, a Slower Traffic Keep Right sign placed at the end of the of the climbing lane taper and typical Lane Ends warning signing. The signing for passing lanes is shown in Figure 6 of [Section 3B-2](#) of the Traffic and Safety Manual. Signing for Passing Lanes is not required where passing lanes have been provided at intersections.

Document Revision History: 12-17-01, 01-27-04, 04-04-06, 05-08-13



TRAFFIC AND SAFETY MANUAL

Chapter 2 – Signing 2A – General

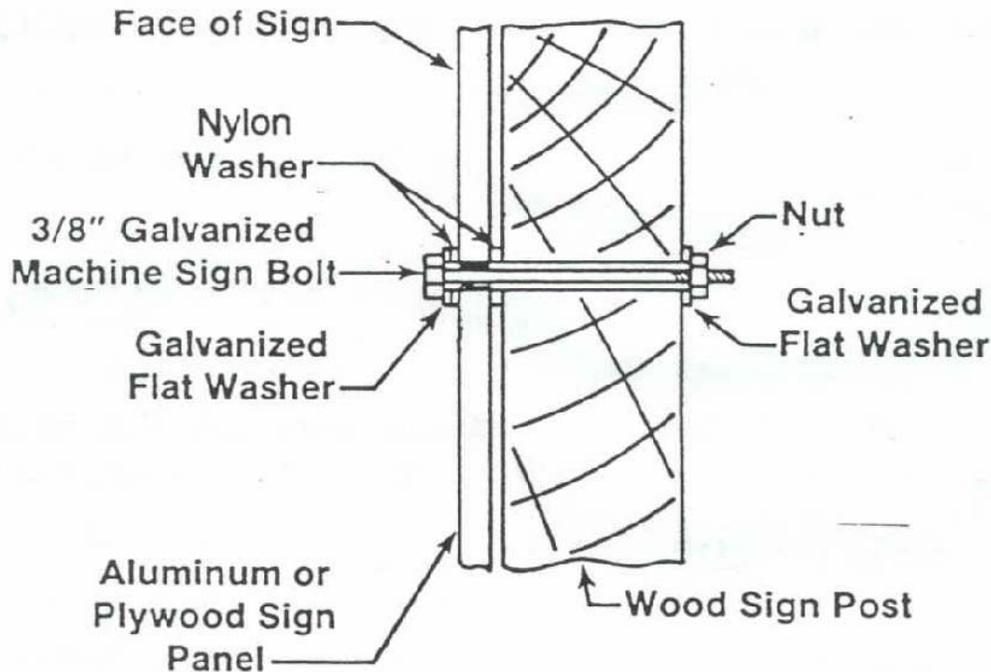
Miscellaneous Requirements

Originally Issued: 12-17-01, Last Revised: 10-02-06

Hardware and Assembly Details

This section provides details on sign mounting. Figure 1 below shows the proper way to fasten a sign panel to a wood post. All Materials shown are available from the warehouse. Bolts, nuts, and flat washers are to be galvanized, or aluminum, to prevent rusting. Nylon washers in the positions shown are important for proper sign installation.

The nut on the back is to be turned to tighten the bolt. If the head is allowed to turn, it may distort the sheeting on the sign surface, and destroy the reflective qualities.



DETAIL FOR FASTENING SIGN TO POST

Figure 1

Typical assemblies for mounting route markers are shown in Figure 2 and Figure 3. Post size and number are determined by using the cumulative area of the individual sign panels. For multiple

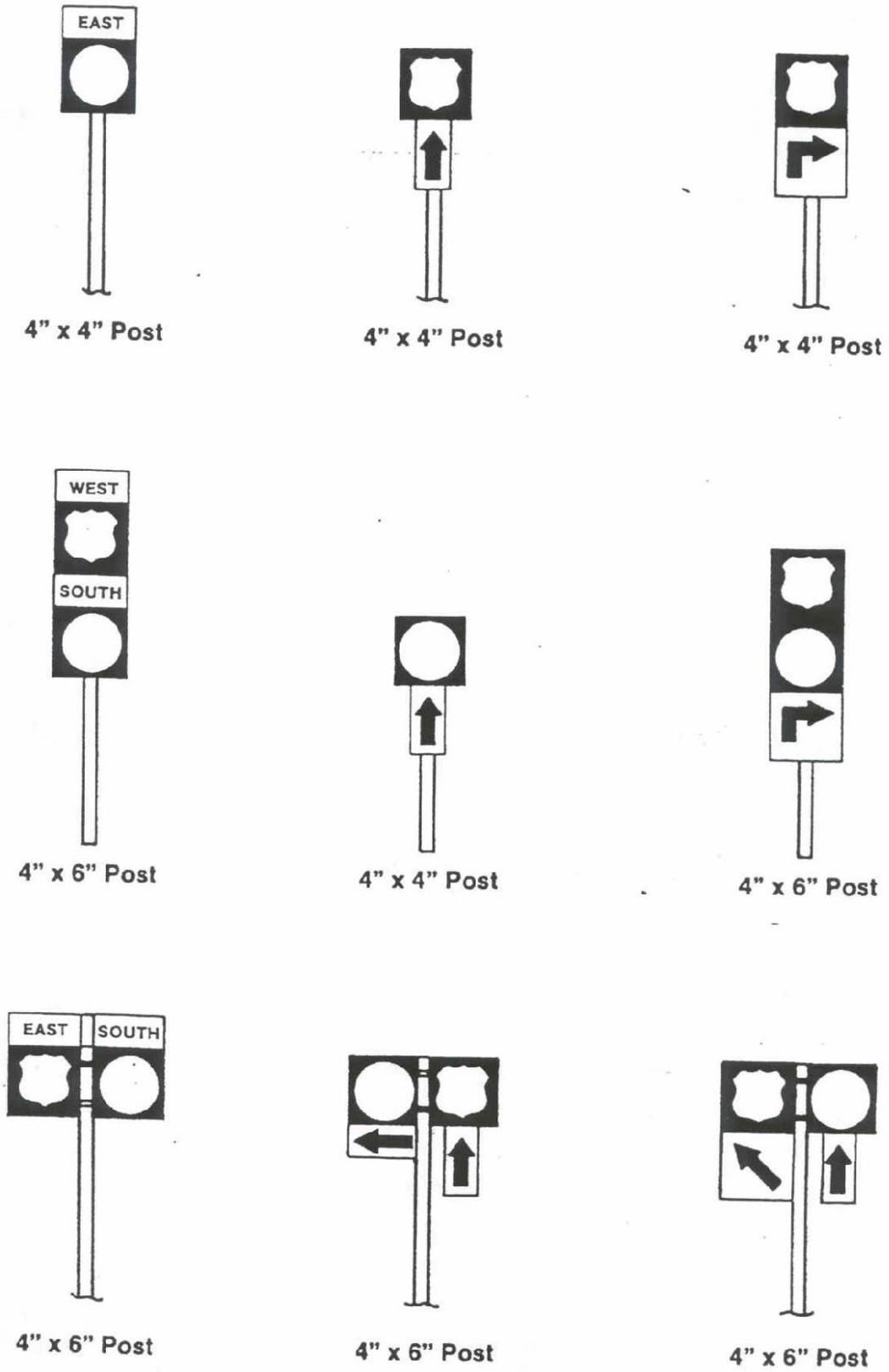
assemblies, left pointing arrow should be on the left side and right pointing arrow on the right side. The bottoms of route markers on multiple panel assemblies should be at the same level.

Brackets are available for mounting several panels in a group on the same post(s). Two sizes are used. One is for a single post assembly and the other is for a two-post assembly. An auxiliary sign-mounting bar is available for fastening signs together. These units are illustrated in Figure 4 and Figure 5.

General Guidelines are as follows:

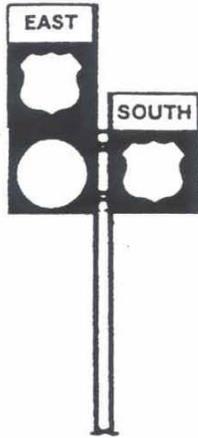
- Interstate route markers should be mounted to the left or above U.S. route markers.
- U.S. route markers should be mounted to the left or above State route markers.
- State route markers should be mounted to the left or above County route markers.
- For route markers with the same designation (Interstate, U.S., etc.) the lower route number should be mounted to the left or above the higher route number.

Route markers for detours should be handled in the same manner.



TYPICAL GUIDE SIGN GROUPING ASSEMBLIES

Figure 2



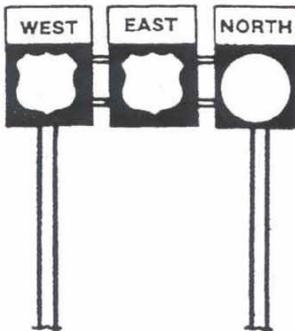
4" x 6" Post



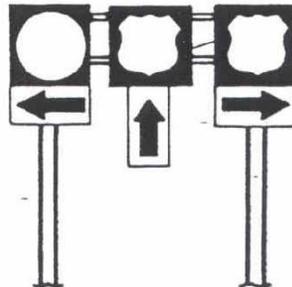
4" x 6" Post



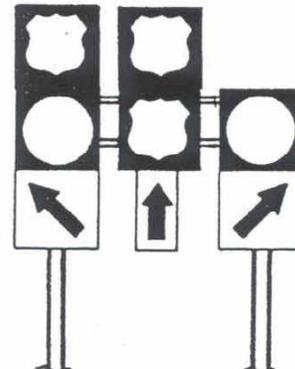
4" x 6" Post



4" x 4" Posts



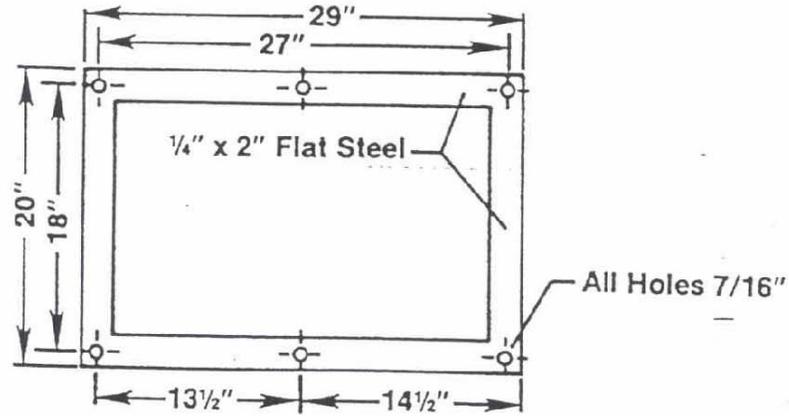
4" x 4" Posts



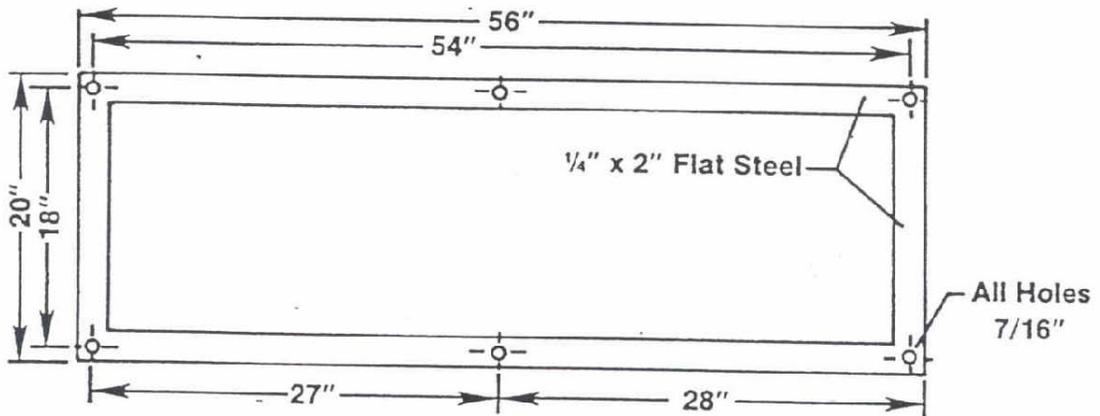
4" x 6" Posts

TYPICAL GUIDE SIGN GROUPING ASSEMBLIES

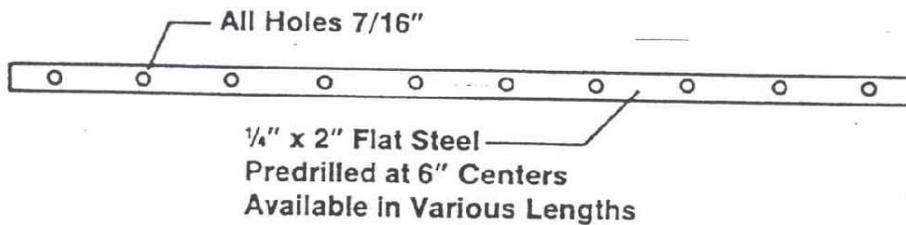
Figure 3



One Post Sign Mounting Bracket



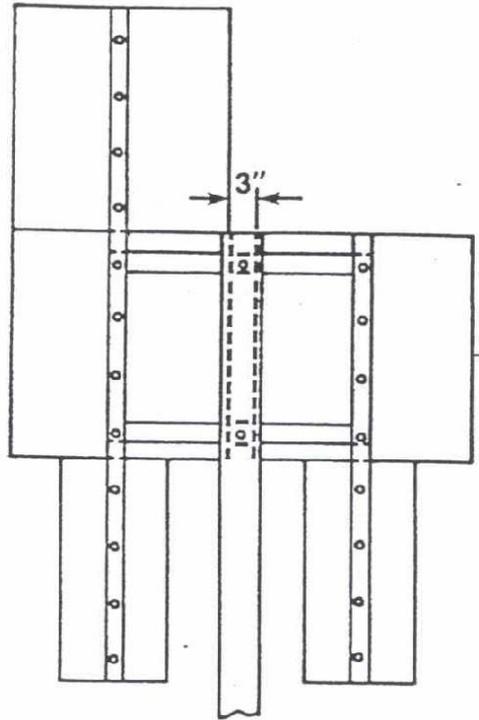
Two Post Sign Mounting Bracket



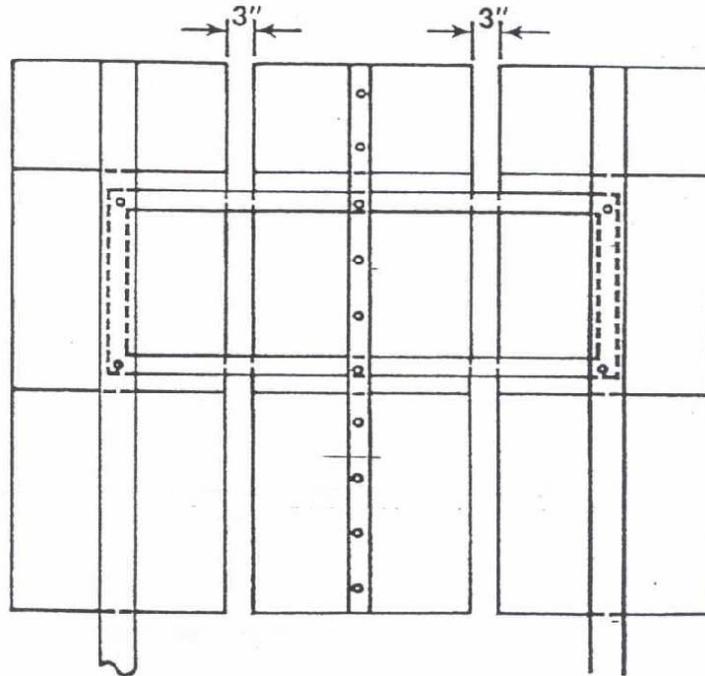
Auxiliary Sign Mounting Bar

SIGN MOUNTING BRACKETS

Figure 4



Typical One Post Sign Installation



Typical Two Post Sign Installation

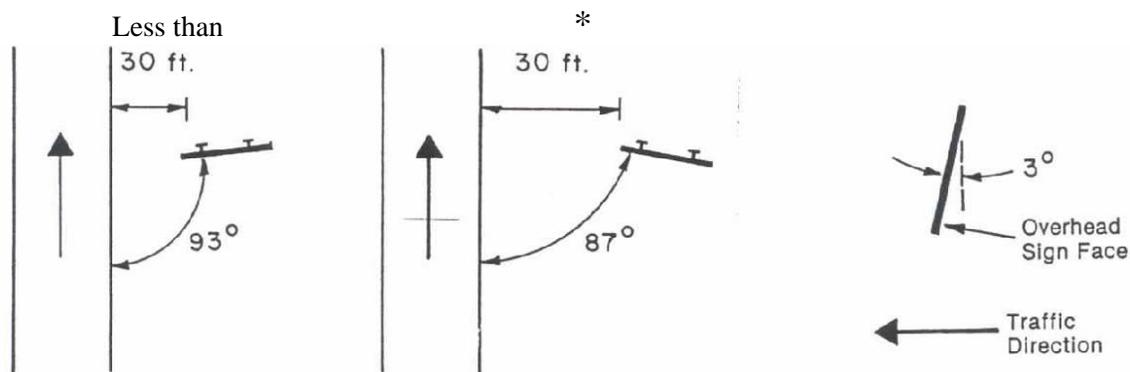
TYPICAL USE OF SIGN MOUNTING BRACKETS

Figure 5

Sign Orientation

Signs are normally mounted at approximately right angles to the direction of traffic that they are intended to serve. Signs located close to the traveled way should be turned slightly away from the roadway to avoid reflection of headlights off the sign face back into the driver's eyes. An angle of approximately 93 degrees to the line of approaching traffic should be used for sign locations less than 30 feet from the pavement edge. For signs 30 feet from the pavement edge, 87 degrees should be used. For each additional 10 feet of sign offset from the pavement edge, the sign should be at one less degree. On curved alignments, the angle should be determined by the course of approach traffic, rather than by the roadway edge at the point where the sign is located. On grades it may be desirable to tilt a sign forward or back from the vertical to improve the viewing angle.

The face of all overhead signs should be tilted at least 3 degrees towards traffic. This will help insure that dirt, dust, snow, and bird droppings will not drop onto the sign face. Figure 6 illustrates proper orientation of signs.



Orientation of Signs

* For each additional 10 feet of sign offset, the sign should be at one less degree (i.e. 40 ft, 86 deg)

Figure 6

Where two roads intersect at an acute angle, the stop sign should be positioned at an angle or shielded so that the legend is out of view of traffic to which it does not apply. Such installations should be reviewed during the day and at night to ensure that legibility of the sign for traffic to be stopped is not compromised.

Sizes of Signs for Conventional Roads, Expressways and Freeways

For the purposes of this section, definitions of the types of roads are as follows:

- Conventional Roads: Two-lane, multi-lane undivided and multi-lane divided with raised median or lowered median less than 30 feet wide.
- Expressway: Multi-lane divided with lowered median 30 feet or more wide.
- Freeway: Multi-lane divided with access only at interchanges.

Sign dimensions for regulatory and warning signs shall be as shown in [Table 2B-1](#) and [Table 2C-2](#) of the MUTCD. Sign dimensions for many guide signs are variable depending on the length of message and the size of lettering needed for proper legibility. For guide signs with standardized designs, such as route signs, the sizes shall be as shown in the "[Standard Highway Signs](#)" book.

Route sign auxiliary sizes are shown in the Iowa DOT sign catalog.

Increases above listed sizes are desirable where greater emphasis is needed. Some of the most commonly used sign sizes for use on Iowa primary highways are shown in Table 1, Stop Sign Sizes and Table 2, Speed Reduction and Speed Limit Sign Sizes.

Table 1

Stop Sign Sizes

Stopped Route	Through Route	
	Conventional	Expressway
Conventional Non-Primary	30 inch	36 inch
Conventional Primary	36 inch	36 inch
Expressway	48 inch	48 inch
Expressway Ramps	48 inch	48 inch
Freeway Ramps	48 inch	48 inch

Table 2

Speed Reduction and Speed Limit Sign Sizes

	Conventional		Expressway	Freeway
	Speed Limit 45 mph or less	Speed Limit More than 45 mph		
Speed Limit	24 in x 30 in	36 in x 48 in	48 in x 60 in	48 in x 60 in
Speed Reduction	36 in x 36 in	36 in x 36 in	48 in x 48 in	48 in x 48 in
1st Speed Limit Sign Following Speed Reduction Sign	36 in x 48 in	36 in x 48 in	48 in x 60 in	48 in x 60 in

Sign Reflectivity and Illumination

Regulatory, warning and guide signs must be retroreflective or illuminated to show the same shape and similar color by both day and night. Since the retroreflective materials currently in use perform effectively without illumination, it is not necessary to provide lighting for roadside or overhead signs. The State Traffic Engineer will provide assistance for individual cases at the request of the District Office.

Document Revision History: 12-17-01, 01-27-04, 06-19-06, 10-02-06



TRAFFIC AND SAFETY MANUAL

Chapter 2 – Signing 2A - General

Typicals and Additional Figures

Originally Issued: 12-17-01, Last Revised: 05-02-13

<u>Figure</u>	<u>Title</u>
1	Typical Guide Signs and No Passing Zones At Primary Highway Intersections
2	Route Markings, Intersection of Primary and Secondary Road with Destination Sign
3	Route Markings, Intersection of Primary with Primary and Secondary Roads with Destination Signs
4	Route Markings, Secondary Road Concurrent with Primary Road
5	Route Markings, Primary Road Concurrent with Primary Road
6	Standard Signing at the Corporate Limits
7	“City Name” Signing Along a Highway Through an Undeveloped Section of a City
8	Typical Signing for a County Detour Route on a Primary Route
9	Typical Rumble Strip Panel Locations and Signing
10-15	Typical Signing for Crossovers with Variable Median Widths
16	Sign Placement Approaching a Railroad Crossing

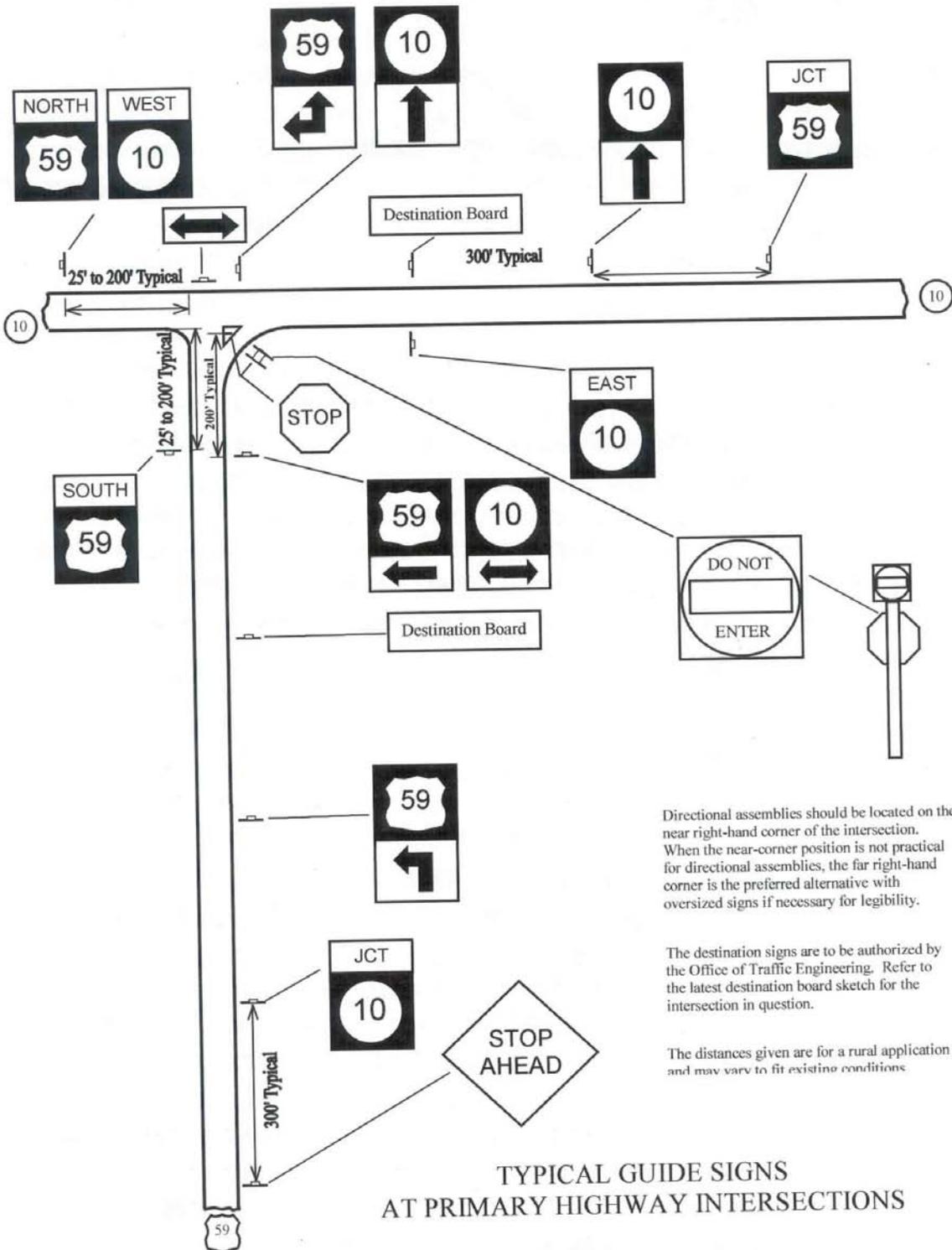


Figure 1

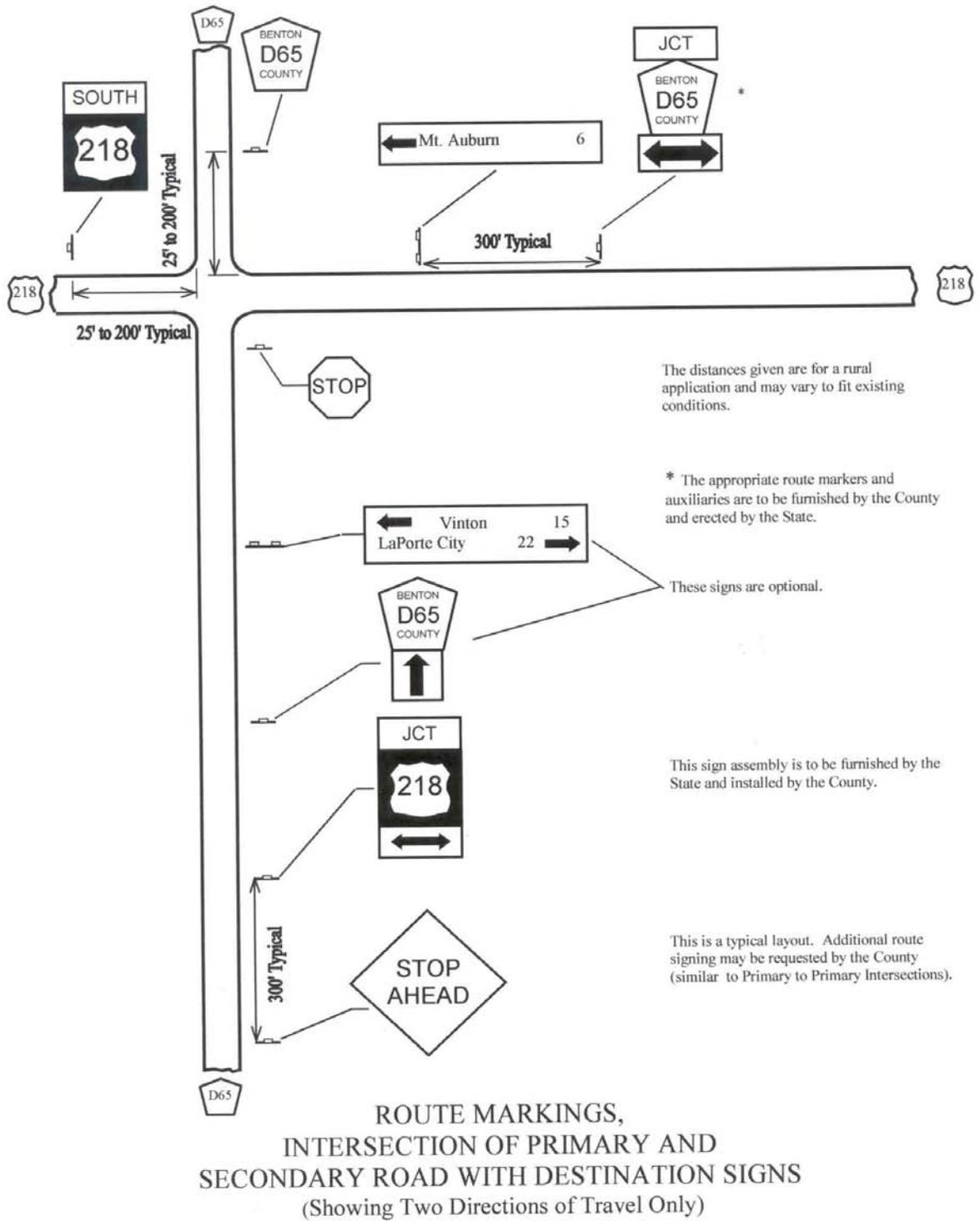
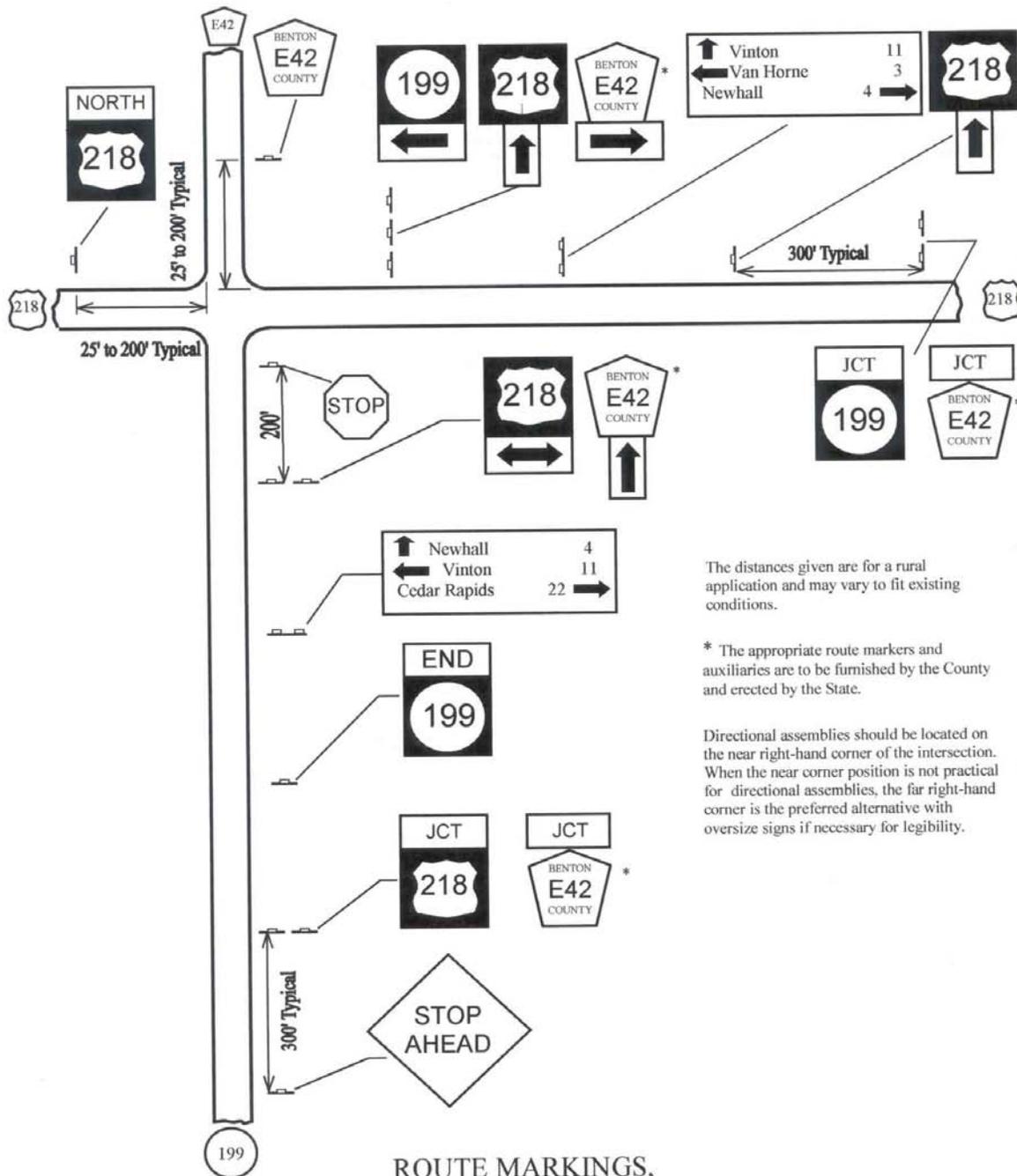


Figure 2



The distances given are for a rural application and may vary to fit existing conditions.

* The appropriate route markers and auxiliaries are to be furnished by the County and erected by the State.

Directional assemblies should be located on the near right-hand corner of the intersection. When the near corner position is not practical for directional assemblies, the far right-hand corner is the preferred alternative with oversize signs if necessary for legibility.

ROUTE MARKINGS,
INTERSECTION OF PRIMARY WITH PRIMARY AND
SECONDARY ROADS WITH DESTINATION SIGNS
(Showing Two Directions of Travel Only)

Figure 3

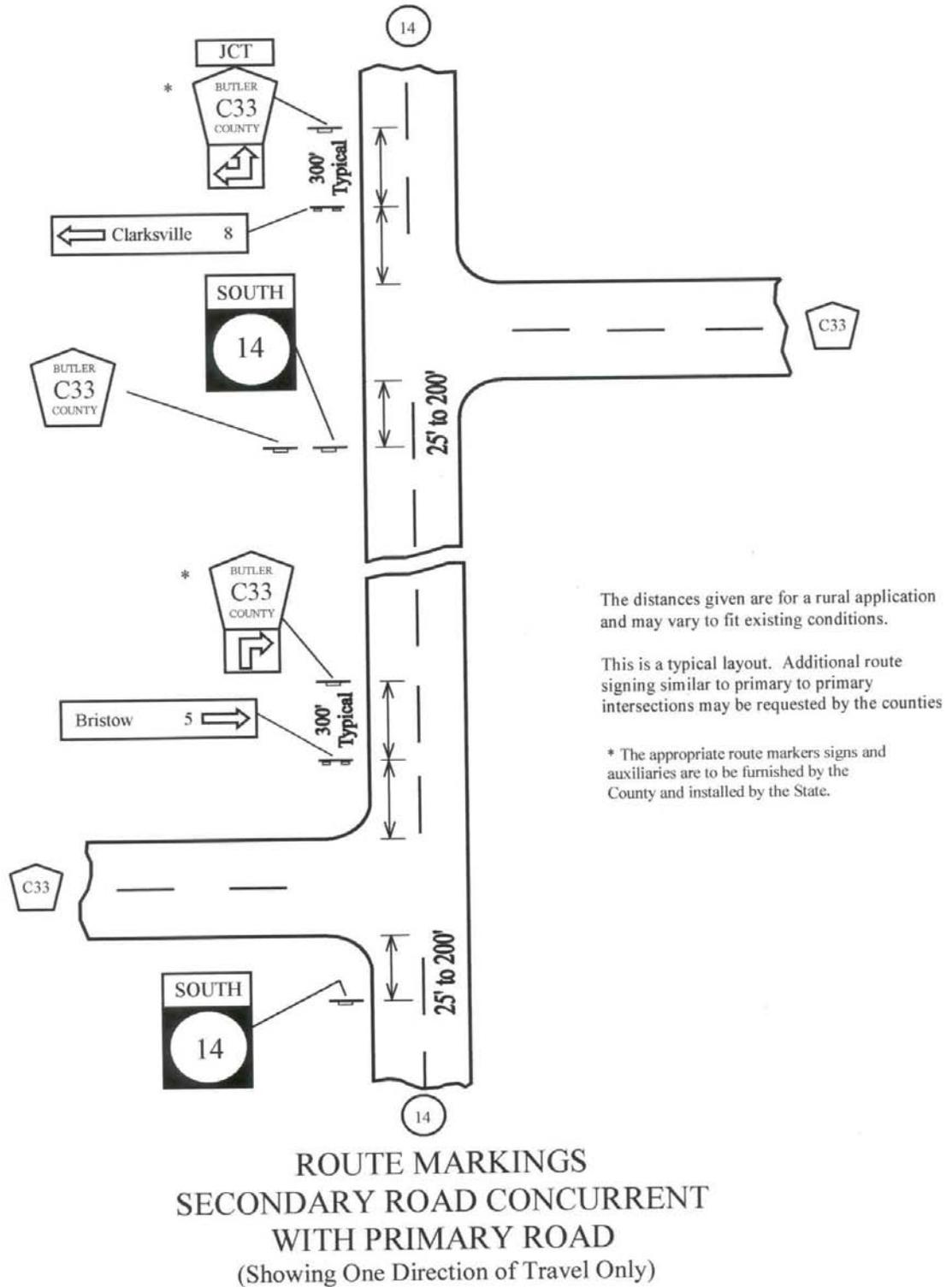
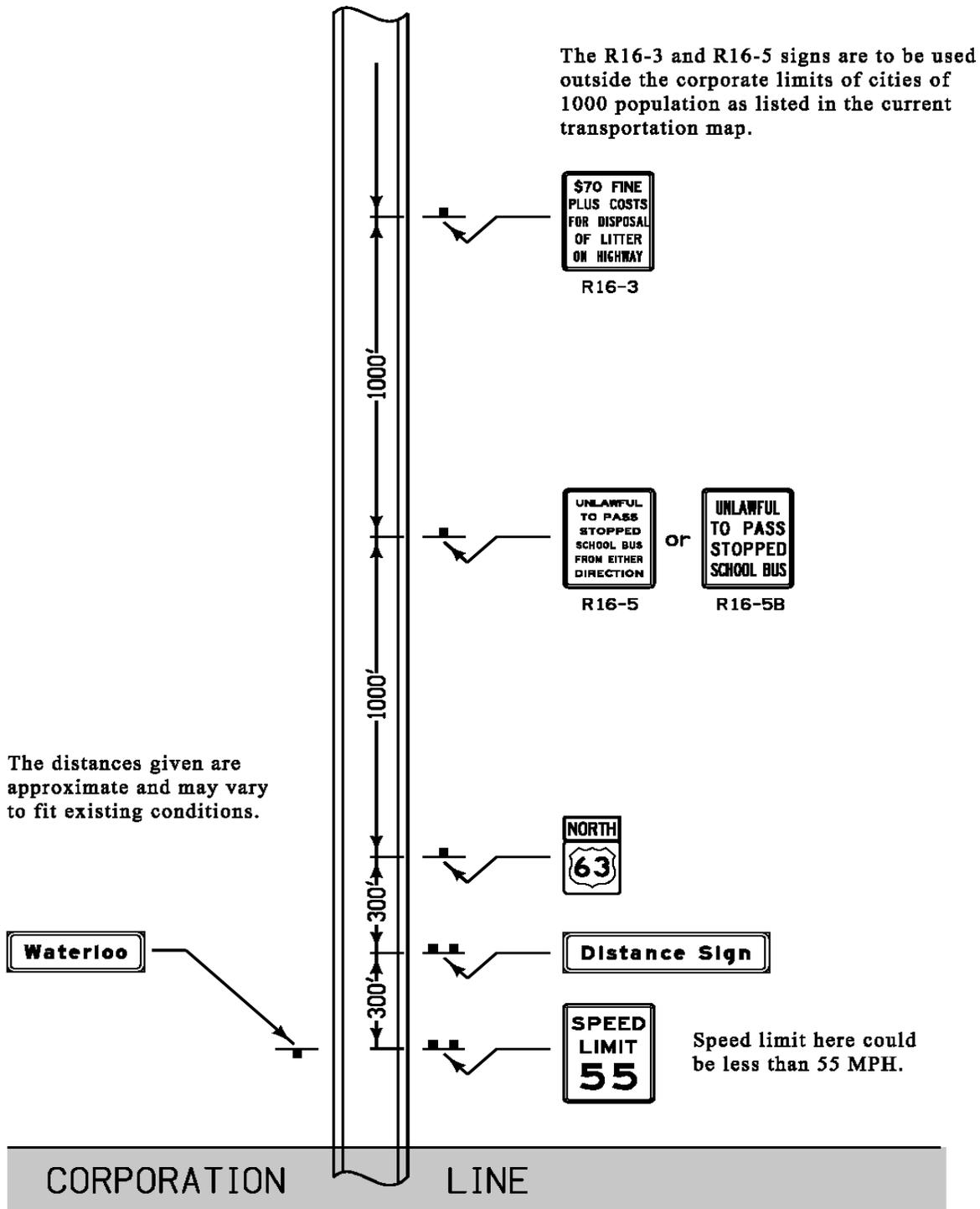
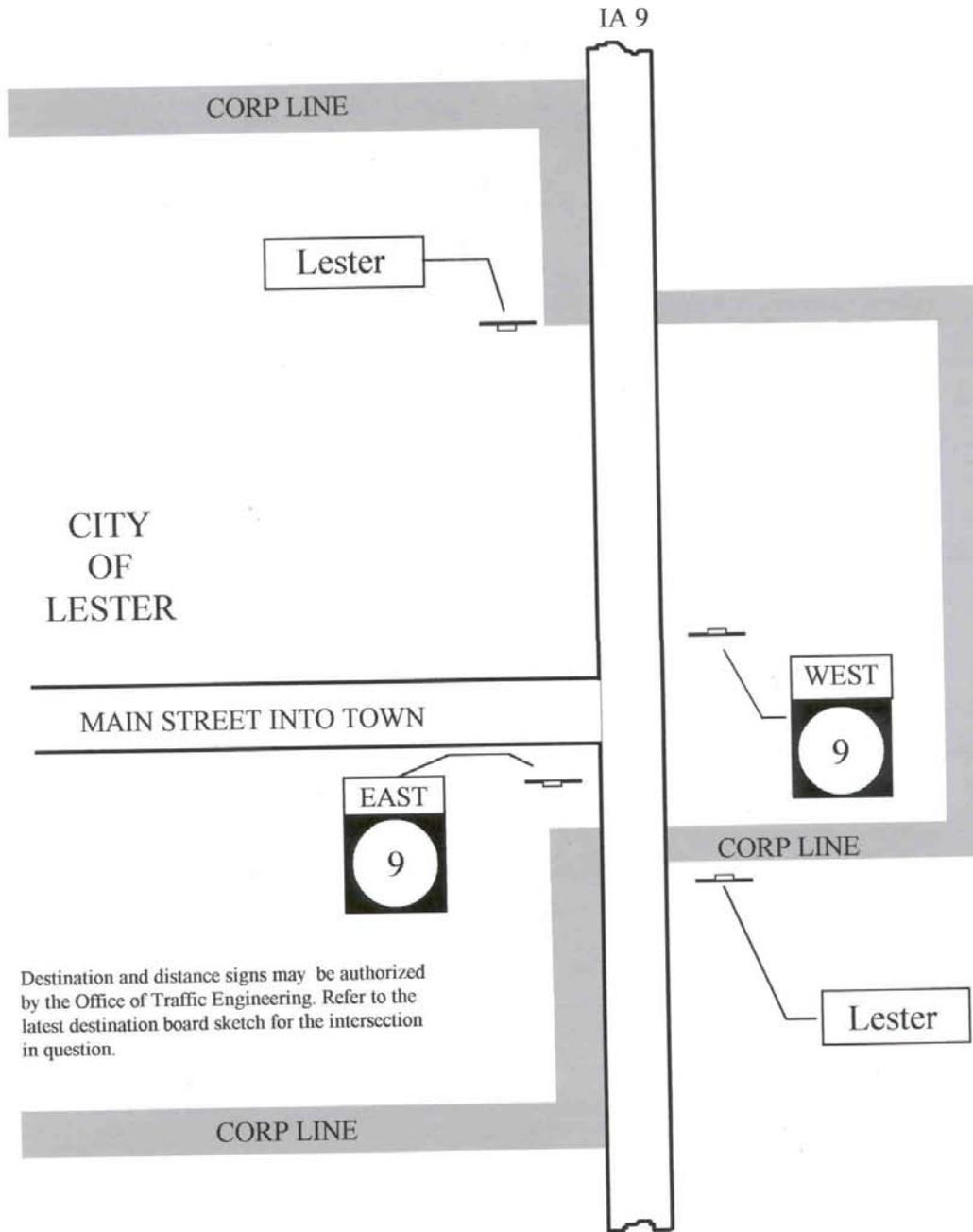


Figure 4



STANDARD SIGNING AT THE CORPORATE LIMITS

Figure 6



“CITY NAME” SIGNING ALONG A HIGHWAY
THROUGH AN
UNDEVELOPED SECTION OF A CITY

Figure 7

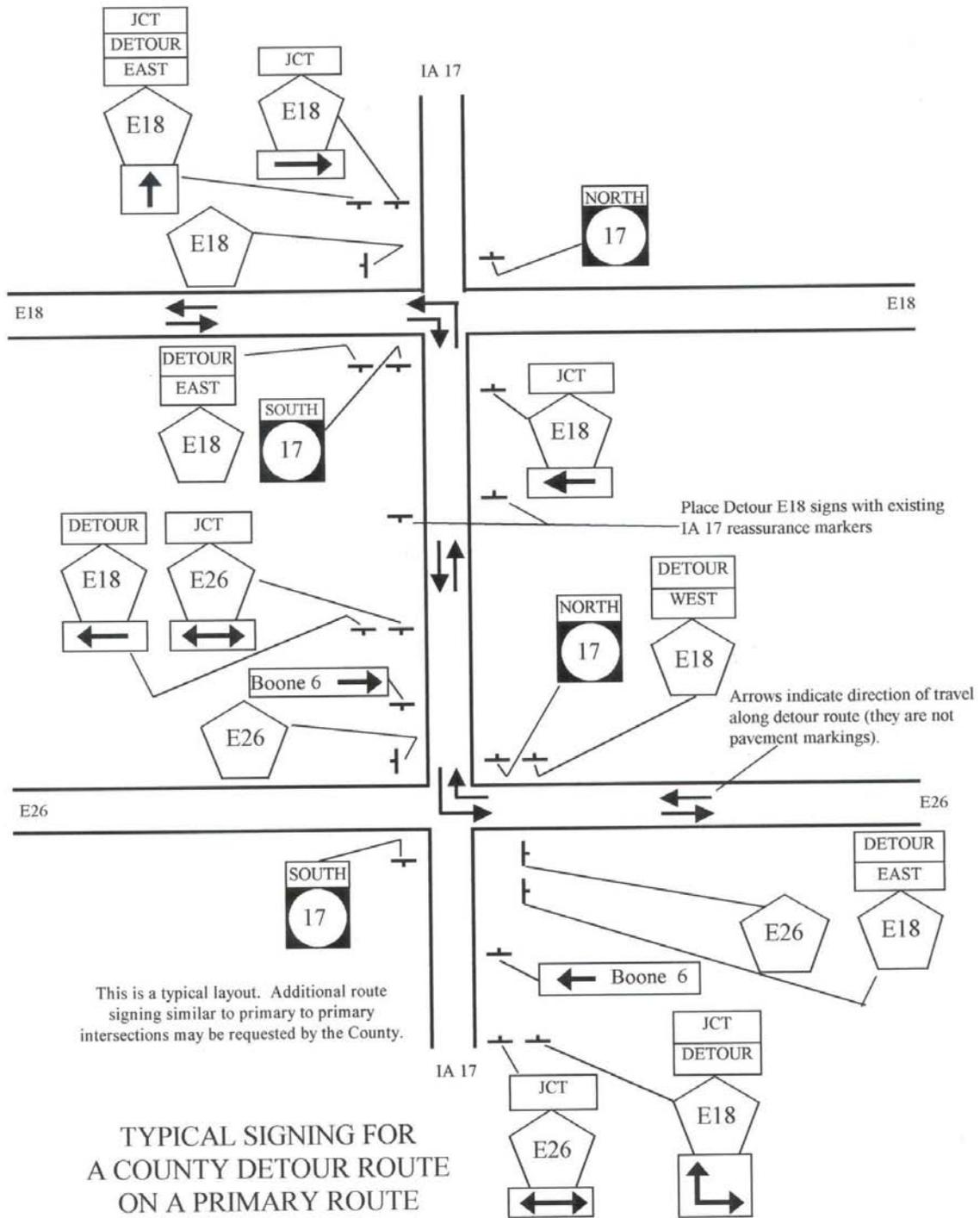
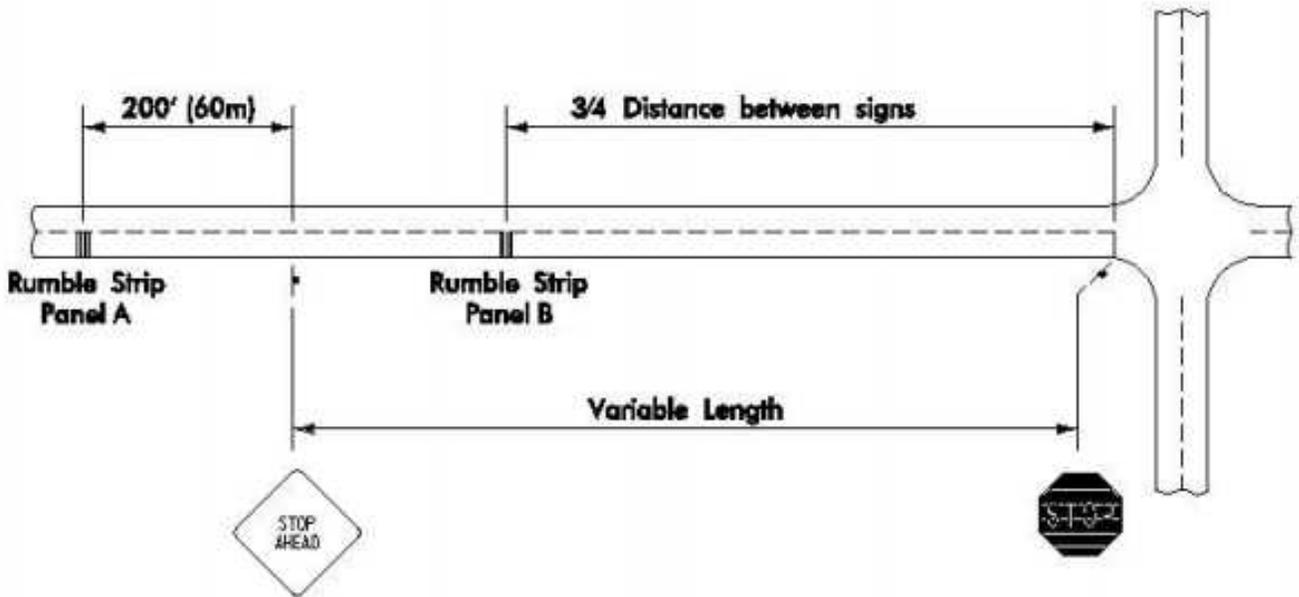


Figure 8

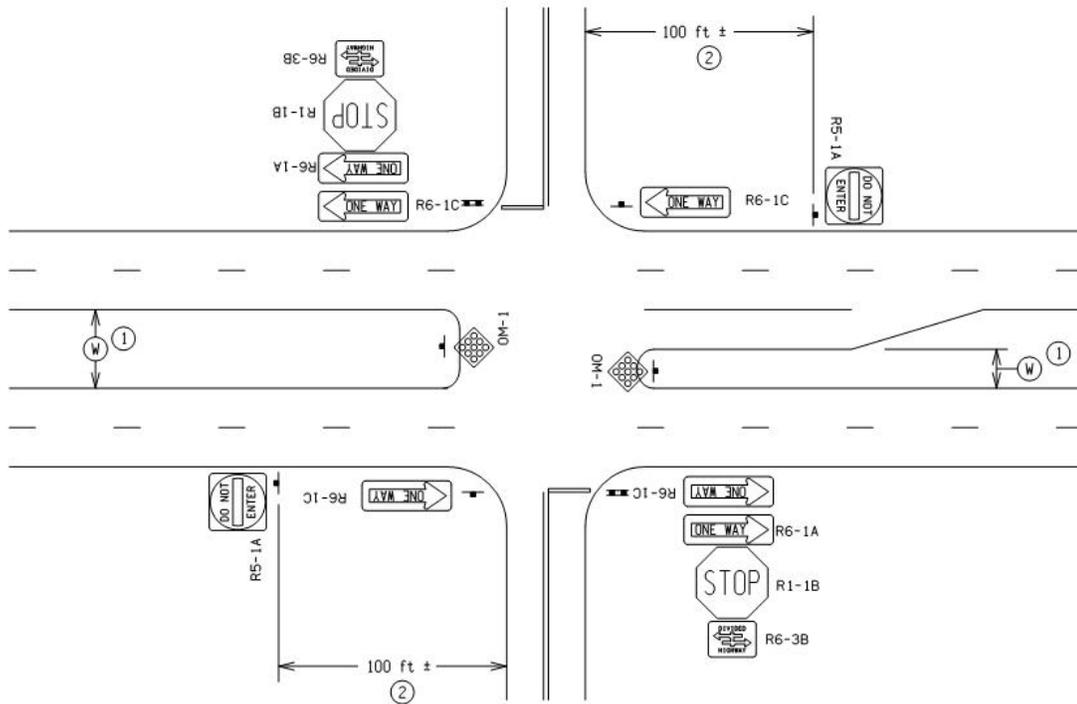


Typical Rumble Strip
Panel Location and Signing

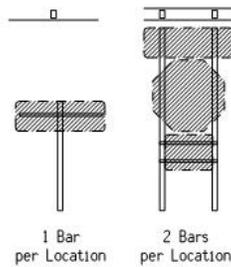
Figure 9

IC-110
06-01-08

Pavement marking shown are for information only.
Refer to Typical 9107 for requirements.



TYPE 'A' SIGNS		
SIGN NUMBER	SIGN SIZE	NO OF SIGNS
R1-1B	48 x 48	2
R5-1A	36 x 36	2
R6-1A	54 x 18	2
R6-1C	54 x 18	4
R6-3B	36 x 30	2
OM-1	18 x 18	2
TOTALS		14



- Measure W as follows:
 - from painted edge line to painted edge line,
 - outside the intersection return geometry, but not beyond the left turn lane (if present).

When W on the left and right differ, use the smaller value to determine which typical is appropriate.
 - Measure the setback for the Do Not Enter sign from the sideroad edge of pavement.
- Mount One-Way signs above all other signs in a sign assembly.

4 x 6 WOOD POSTS FOR SIGNS		
Qty.	Post Length	Total
6	20	120
4 *	24	96
		216

* Extra long posts required for sideroad stop assemblies.

SPECIAL MOUNTING BRACKETS	
Type	Quantity
Auxillary Mounting Bar	6
	6

- ▬ Mount sign(s) on a single post
 - ▬▬ Mount signs back to back on a single post
 - ▬▬▬ Mount signs back to back on two posts
- W Width between pavement

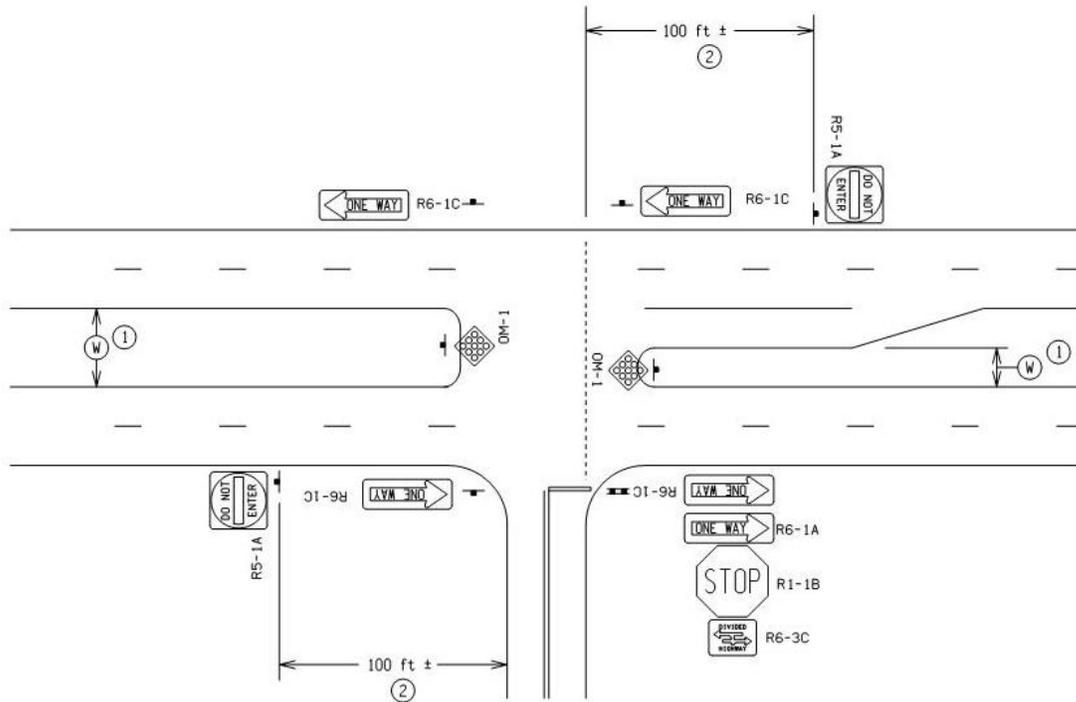
**INTERSECTION CONTROL SIGNING
FOR EXPRESSWAY INTERSECTIONS
WITH TWO-WAY STOP CONDITION**

**WIDTH BETWEEN PAVEMENT
LESS THAN 30 FT, AND
SPEED LIMIT AT LEAST 55 MPH**

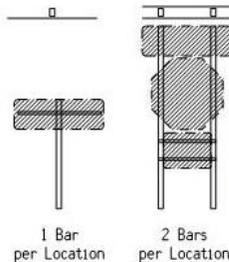
Figure 10

IC-115
06-01-08

Pavement marking shown are for information only.
Refer to Typical 9107 for requirements.



TYPE 'A' SIGNS		
SIGN NUMBER	SIGN SIZE	NO OF SIGNS
R1-1B	48 x 48	1
R5-1A	36 x 36	2
R6-1A	54 x 18	1
R6-1C	54 x 18	4
R6-3C	36 x 30	1
OM-1	18 x 18	2
TOTALS		11



- ① Measure (W) as follows:
 - from painted edge line to painted edge line,
 - outside the intersection return geometry, but not beyond the left turn lane (if present).

When W on the left and right differ, use the smaller value to determine which typical is appropriate.

- ② Measure the setback for the Do Not Enter sign from the side road edge of pavement.

Mount One-Way signs above all other signs in a sign assembly.

4 x 6 WOOD POSTS FOR SIGNS		
Qty.	Post Length	Total
7	20	140
2 *	24	48
		188

* Extra long posts required for side road stop assemblies.

SPECIAL MOUNTING BRACKETS	
Type	Quantity
Auxiliary Mounting Bar	5
	5

- ▬ Mount sign(s) on a single post
- ▬▬ Mount signs back to back on a single post
- ▬▬▬ Mount signs back to back on two posts

(W) Width between pavement

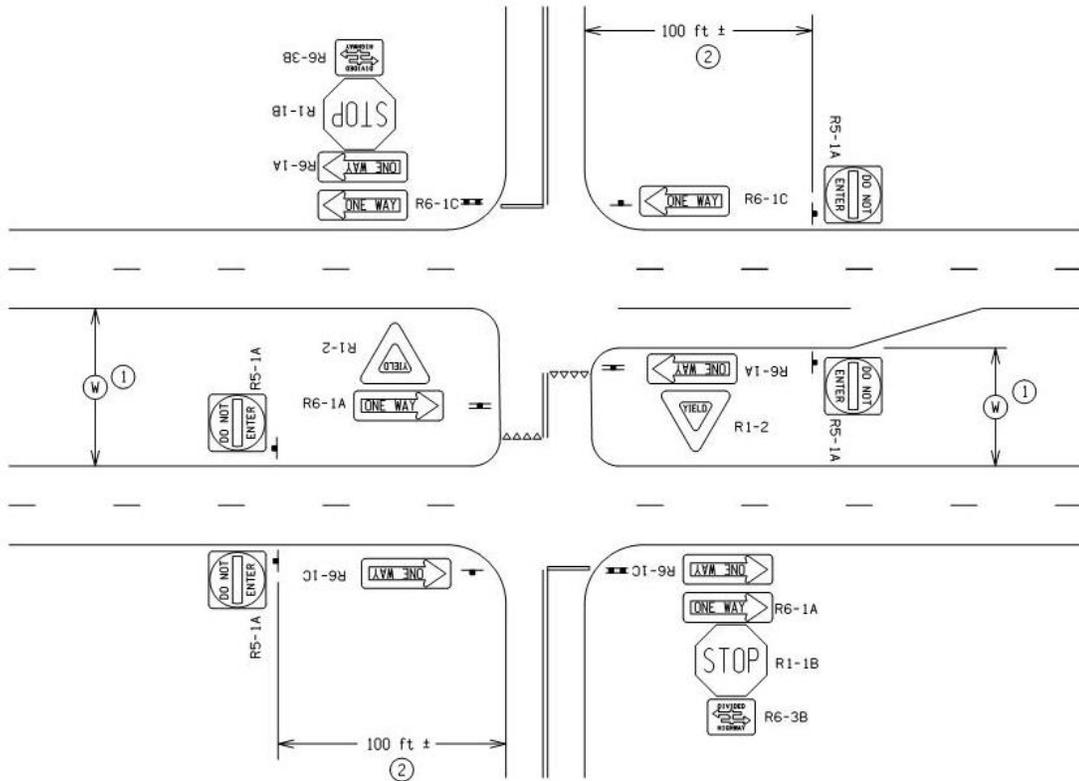
**INTERSECTION CONTROL SIGNING
FOR EXPRESSWAY INTERSECTIONS
WITH ONE-WAY STOP CONDITION**

**WIDTH BETWEEN PAVEMENT
LESS THAN 30 FT, AND
SPEED LIMIT AT LEAST 55 MPH**

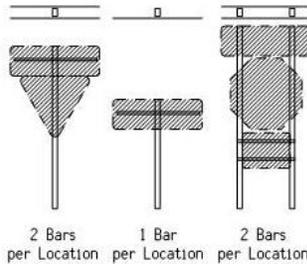
Figure 11

IC-120
06-01-08

Pavement marking shown are for information only.
Refer to Typical 9107 for requirements.



TYPE 'A' SIGNS		
SIGN NUMBER	SIGN SIZE	NO OF SIGNS
R1-1B	48 x 48	2
R1-2	48 x 48 x 48	2
R5-1A	36 x 36	4
R6-1A	54 x 18	4
R6-1C	54 x 18	4
R6-3B	36 x 30	2
TOTALS		18



- Measure \textcircled{W} as follows:
 - from painted edge line to painted edge line,
 - outside the intersection return geometry, but not beyond the left turn lane (if present).
 When W on the left and right differ, use the smaller value to determine which typical is appropriate.
 - Measure the setback for the Do Not Enter sign from the sideroad edge of pavement.
- Mount One-Way signs above all other signs in a sign assembly.

4 x 6 WOOD POSTS FOR SIGNS		
Qty.	Post Length	Total
8	20	160
4 *	24	96
		256

* Extra long posts required for sideroad stop assemblies.

SPECIAL MOUNTING BRACKETS	
Type	Quantity
Auxiliary Mounting Bar	8
	8

- Mount sign(s) on a single post
- Mount signs back to back on a single post
- Mount signs back to back on two posts

\textcircled{W} Width between pavement

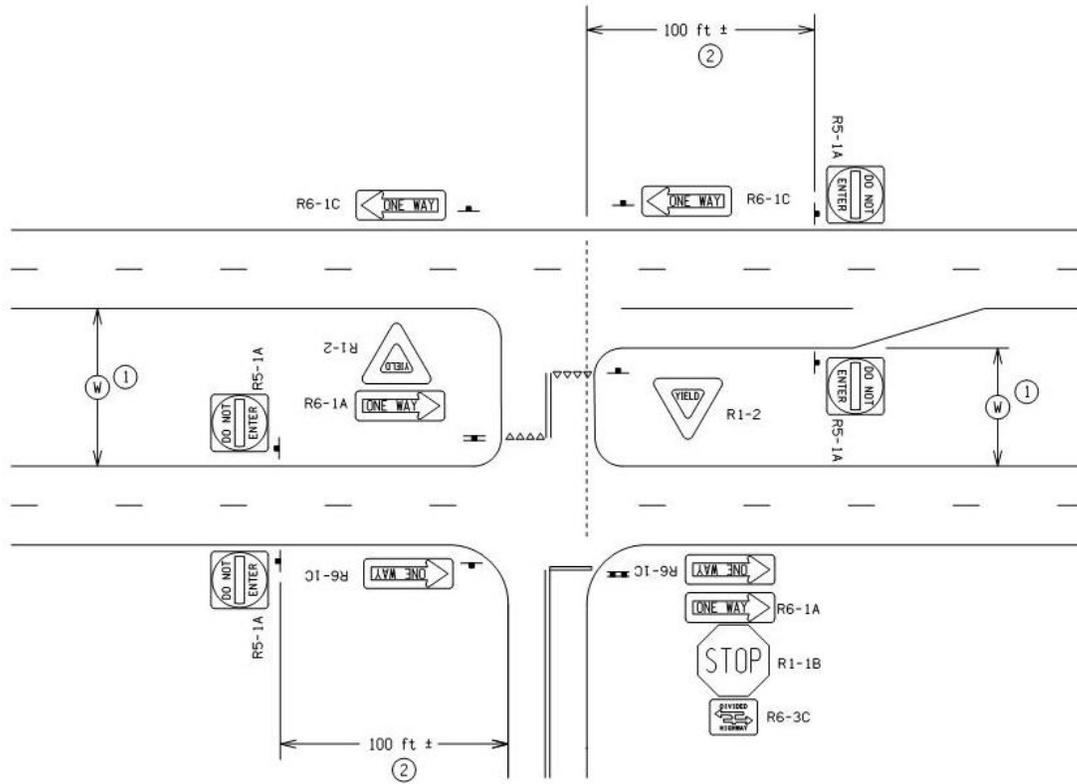
**INTERSECTION CONTROL SIGNING
FOR EXPRESSWAY INTERSECTIONS
WITH TWO-WAY STOP CONDITION**

**WIDTH BETWEEN PAVEMENT
FROM 30 FT TO 80 FT**

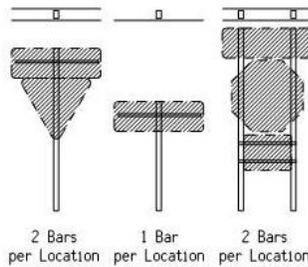
Figure 12

Pavement marking shown are for information only.
Refer to Typical 9107 for requirements.

IC-125
06-01-08



TYPE 'A' SIGNS		
SIGN NUMBER	SIGN SIZE	NO OF SIGNS
R1-1B	48 x 48	1
R1-2	48 x 48 x 48	2
R5-1A	36 x 36	4
R6-1A	54 x 18	2
R6-1C	54 x 18	4
R6-3C	36 x 30	1
TOTALS		14



- Measure (W) as follows:
 - from painted edge line to painted edge line,
 - outside the intersection return geometry, but not beyond the left turn lane (if present).

When W on the left and right differ, use the smaller value to determine which typical is appropriate.
 - Measure the setback for the Do Not Enter sign from the sideroad edge of pavement.
- Mount One-Way signs above all other signs in a sign assembly.

4 x 6 WOOD POSTS FOR SIGNS		
Qty.	Post Length	Total
9	20	180
2 *	24	48
		228

* Extra long posts required for sideroad stop assemblies.

SPECIAL MOUNTING BRACKETS	
Type	Quantity
Auxiliary Mounting Bar	6
	6

- ▬ Mount sign(s) on a single post
 - ▬▬ Mount signs back to back on a single post
 - ▬▬▬ Mount signs back to back on two posts
- (W) Width between pavement

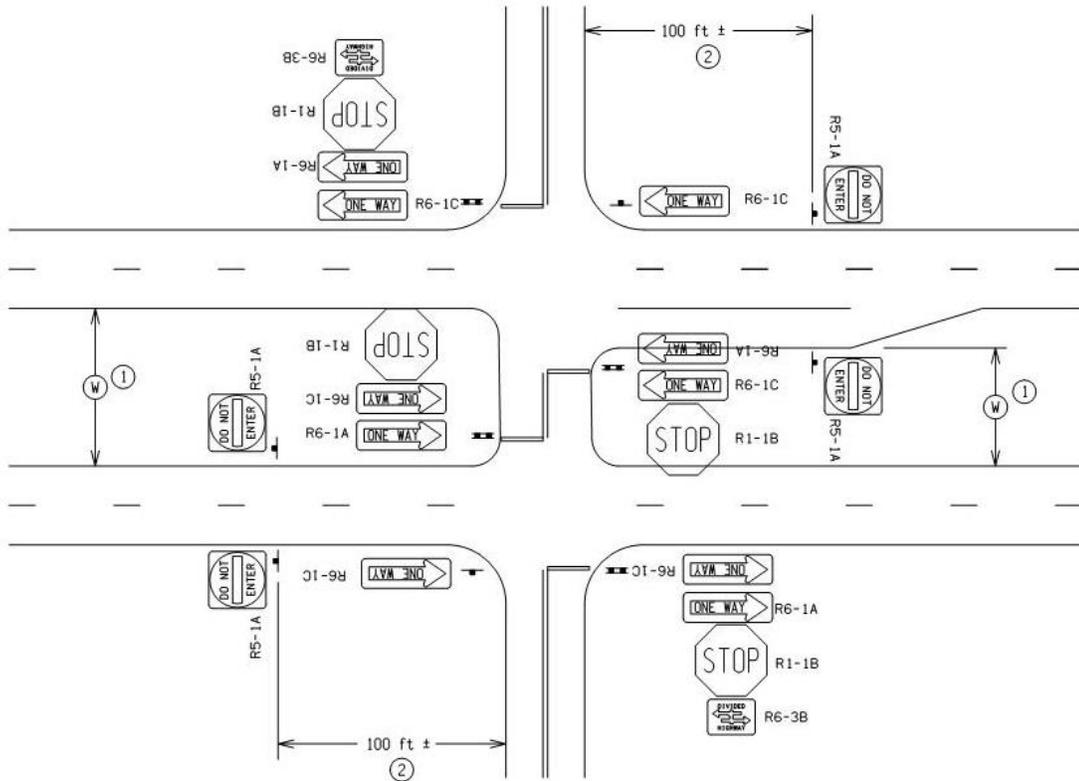
INTERSECTION CONTROL SIGNING FOR EXPRESSWAY INTERSECTIONS WITH ONE-WAY STOP CONDITION

WIDTH BETWEEN PAVEMENT FROM 30 FT TO 80 FT

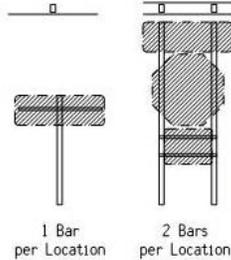
Figure 13

IC-130
06-01-08

Pavement marking shown are for information only.
Refer to Typical 9107 for requirements.



TYPE 'A' SIGNS		
SIGN NUMBER	SIGN SIZE	NO OF SIGNS
R1-1B	48 x 48	4
R5-1A	36 x 36	4
R6-1A	54 x 18	4
R6-1C	54 x 18	6
R6-3B	36 x 30	2
TOTALS		20



- ① Measure \textcircled{W} as follows:
 - from painted edge line to painted edge line,
 - outside the intersection return geometry, but not beyond the left turn lane (if present).

When W on the left and right differ, use the smaller value to determine which typical is appropriate.

- ② Measure the setback for the Do Not Enter sign from the sideroad edge of pavement.

Mount One-Way signs above all other signs in a sign assembly.

4 x 6 WOOD POSTS FOR SIGNS		
Qty.	Post Length	Total
10	20	200
4 *	24	96
		296

* Extra long posts required for sideroad stop assemblies.

SPECIAL MOUNTING BRACKETS	
Type	Quantity
Auxiliary Mounting Bar	6
	6

- Mount sign(s) on a single post
- Mount signs back to back on a single post
- Mount signs back to back on two posts

\textcircled{W} Width between pavement

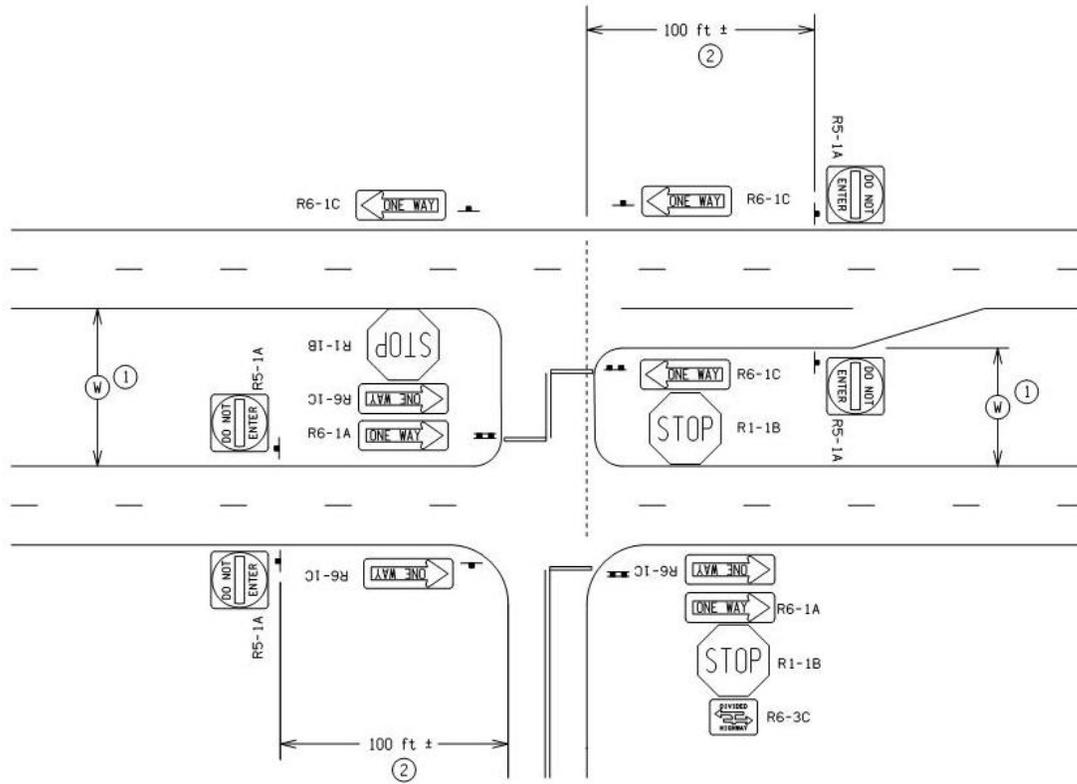
**INTERSECTION CONTROL SIGNING
FOR EXPRESSWAY INTERSECTIONS
WITH TWO-WAY STOP CONDITION**

**WIDTH BETWEEN PAVEMENT
GREATER THAN 80 FT**

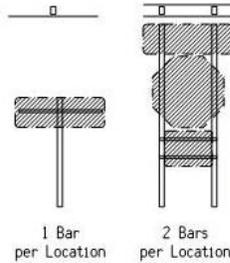
Figure 14

Pavement marking shown are for information only.
Refer to Typical 9107 for requirements.

IC-135
06-01-08



TYPE 'A' SIGNS		
SIGN NUMBER	SIGN SIZE	NO OF SIGNS
R1-1B	48 x 48	3
R5-1A	36 x 36	4
R6-1A	54 x 18	2
R6-1C	54 x 18	6
R6-3C	36 x 30	1
TOTALS		16



- Measure (W) as follows:
 - from painted edge line to painted edge line,
 - outside the intersection return geometry, but not beyond the left turn lane (if present).

When W on the left and right differ, use the smaller value to determine which typical is appropriate.

- Measure the setback for the Do Not Enter sign from the sideroad edge of pavement.

Mount One-Way signs above all other signs in a sign assembly.

4 x 6 WOOD POSTS FOR SIGNS		
Qty.	Post Length	Total
11	20	220
2 *	24	48
		268

* Extra long posts required for sideroad stop assemblies.

SPECIAL MOUNTING BRACKETS	
Type	Quantity
Auxiliary Mounting Bar	5
	5

- ▬ Mount sign(s) on a single post
 - ▬▬ Mount signs back to back on a single post
 - ▬▬▬ Mount signs back to back on two posts
- (W) Width between pavement

INTERSECTION CONTROL SIGNING FOR EXPRESSWAY INTERSECTIONS WITH ONE-WAY STOP CONDITION

WIDTH BETWEEN PAVEMENT GREATER THAN 80 FT

Figure 15

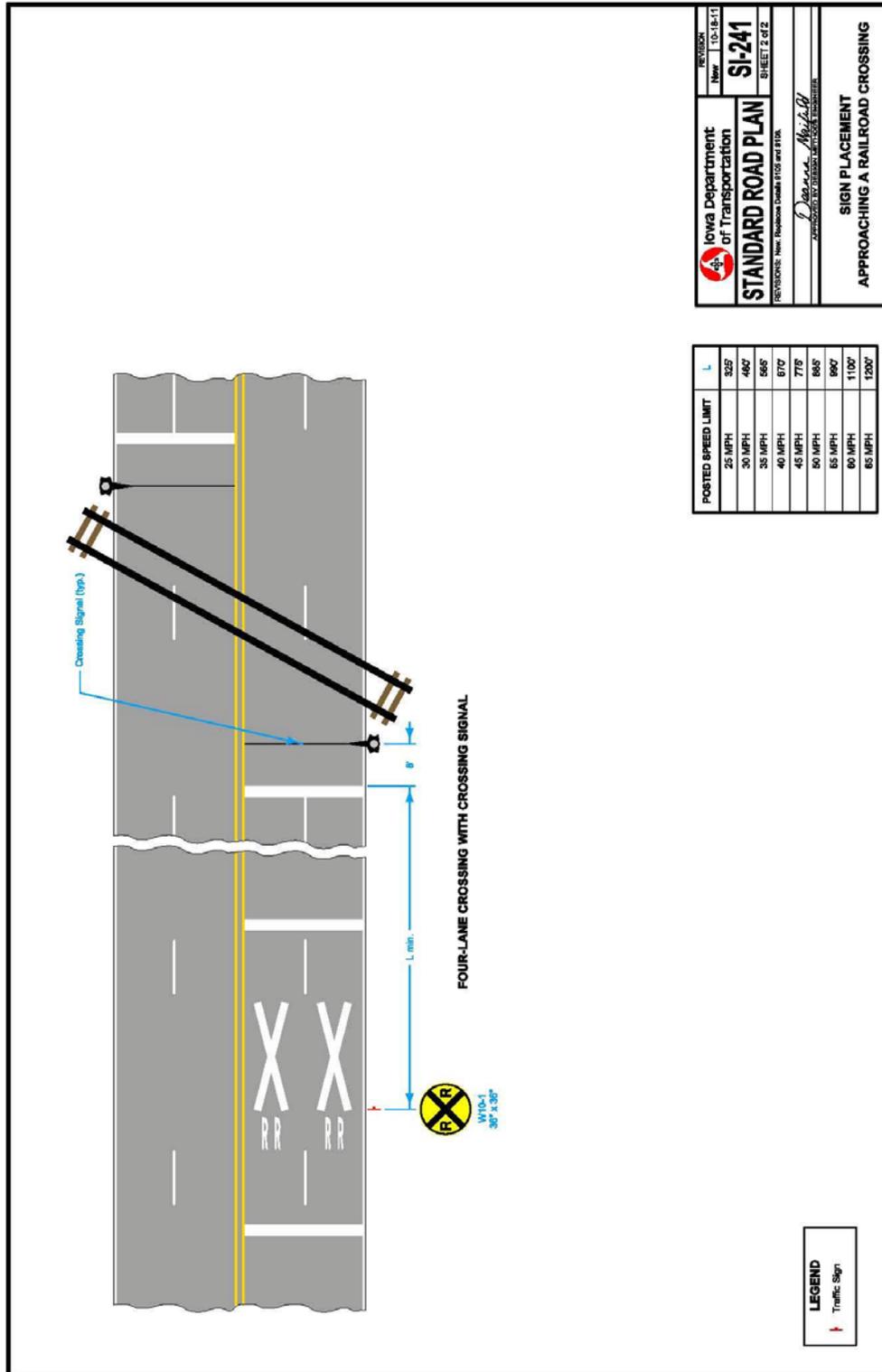


Figure 16b [Standard Road Plan SI-241 Link](#)

Document Revision History: 11-04-10, 05-02-13



TRAFFIC AND SAFETY MANUAL

Chapter 2- Signing 2B – Regulatory Signs

Stop and Yield Signs

Originally Issued: 12-12-05, Last Revised: 01-10-11

Stop Sign

A stop sign is used to indicate that traffic is required to stop. Public approaches to primary highways are controlled by stop signs unless a traffic engineering study and resultant Staff Action or Commission Order provides for the primary highway to stop for a county road or city street. Stop signs may be placed on private drives by the owner of the adjoining property. At the intersection of two or more primary highways a Staff Action or Commission Order designates the stop-controlled approaches unless a standard drawing or construction plan does so for that particular location.

A Cross Traffic Does Not Stop plaque may be used below a Stop sign to inform road users who might misinterpret the intersection as an all-way stop intersection. The State Traffic Engineer will provide assistance with the determination for use of this plaque at the request of the District Office.

A Recheck Cross Traffic Before Proceeding or other plaque with a similar message may be used where an engineering study shows that it would be useful. The State Traffic Engineer will provide assistance at the request of the District Office.

At intersections where all approaches are controlled by stop signs, a supplemental plaque shall be mounted below each stop sign. The supplemental plaque shall be ALL-WAY. Supplemental plaques shall not be placed on stop sign faces. If all approaches are not controlled by stop signs no ALL WAY supplemental plaques are to be used.

Where two roads intersect at an acute angle, the stop sign should be positioned at an angle or else shielded so that the legend is out of view of traffic to which it does not apply.

Portable or part-time stop signs shall not be used except for emergency and temporary traffic control zone purposes, or for school crosswalks as noted in [Administrative Rule 761.130.1\(1\)](#). Also, [Iowa Code Section 321.249](#) permits cities and counties to establish school zones and provide for the stopping of all approaching motor vehicles by using movable stop signs placed in the streets. The procedure for authorization of the signs to be placed on a primary highway or primary highway extension is for the city or county to submit an Application For Approval Of A Traffic Control Device. If a school is involved in placing and removing the sign, then the school may make the application, which must be approved by the city or county prior to Iowa DOT approval.

Procedures to be followed for public notice and special signing when changes occur in stop conditions at primary highway intersections are detailed in [Policy number 620.05](#) of the Policies and Procedures Manual.

Stop sign placement shall be in accordance with [Section 2A-8](#), [Section 2A-9](#) and [Section 2A-10](#) of the Traffic and Safety Manual.

Rumble Strips at Stop Signs

Rumble Strips are generally used in rural areas in advance of locations where primary highway traffic must stop at a Stop sign. A rumble strip panel consists of a series of grooves in the surface to provide a tactile and audible awareness for the driver that may not be fully aware of the other devices in advance of the Stop sign. They are not generally used where the speed limit is less than 55 miles per hour or where the sound would be obtrusive to nearby residences or businesses. When it is decided not to use rumble strips where the speed limit is 55 miles per hour or more, alternative measures may be taken, such as installation of beacons, placement of flags on existing signs, installation of signs on both sides of the road, or use of larger signs. Rumble strips may be installed at locations where the speed limit is less than 55 miles per hour if indicated by a traffic engineering study for that location. The State Traffic Engineer will provide assistance at the request of the District Office.

Location

Typical rumble strip panel locations are shown on Figure 1 of Iowa Dept. of Transportation [Design Manual Section 6A-7](#).

Former standards called for three panels, with the first one being 200 feet in advance of the Stop Ahead sign, the third one 300 feet in advance of the Stop Line and the center one midway between those two. Current design requires only two panels with the first panel located 200 feet in advance of the Stop Ahead sign and the second one located 75% of the distance from the Stop sign to the Stop Ahead sign. Where bridges, railroad crossings or other such features make it impossible to place the rumble strips in their standard locations, they may be moved in consideration of site conditions.

Design

Each rumble strip panel is 24 feet in length, consisting of 25 grooves placed at one-foot intervals perpendicular to centerline. An 18-inch width of pavement at the outside edge of the lane is left uncut to accommodate bicycles. When cut in portland cement concrete or hot mix asphalt concrete the grooves are 3/8 inch deep and 4 inches wide. When cast in plastic portland cement concrete the grooves are 3/4 inch deep, four inches wide at the top and one inch wide at the bottom. These and other design details are shown on Office of Design [Detail 7132](#). It is critical that the design details be adhered to so that the proper tactile and audible awareness is achieved without being too rough or noisy.

Yield Sign

The Yield sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a Yield sign need to slow down or stop when necessary to avoid interfering with conflicting traffic. Yield signs are used where designated by a Staff Action or Commission Order or where shown on a standard drawing or construction plan. They are normally used at the second crossroad of a divided highway, where the median is more than 30 feet but less than 100 feet in width. They may be used to control a merging movement on an entering roadway or entrance ramp where acceleration geometry and /or sight distance is less than desirable for merging traffic operation. They may also be used at a channelized all-way stop intersection on the separate turning roadways. Yield signs shall be used at roundabouts.

Where two roads intersect at an acute angle, the yield sign should be positioned at an angle or else shielded so that the legend is out of view of traffic to which it does not apply.

Yield sign placement shall be in accordance with [Section 2A-8](#), [Section 2A-9](#) and [Section 2A-10](#) of the Traffic and Safety Manual.

Stop or Yield Sign at Passive Railroad Crossings

By definition, passive highway-rail crossings are those having warning devices such as signs and pavement markings located at or in advance of grade crossings to indicate the presence of a crossing but which do not change aspect upon the approach or presence of a train. The 2003 MUTCD requires the Crossbuck (R15-1) sign for all highway approaches to railroad grade crossings. It also allows the optional use of Yield or Stop signs at passive crossings that have two or more trains per day and at other passive crossings based on an engineering study. Yield signs are to be placed at all passive crossings on primary highways in Iowa unless a study performed by the Iowa Dept. of Transportation indicates Stop or no control other than the Crossbuck or Flagger control.

The signs should be placed on the same post as the Crossbuck and therefore should be the responsibility of the rail company, along with the strip of retroreflective material on the front and back of the support. Should rail company policy preclude the placement of other signs on the Crossbuck support, the Stop or Yield sign is to be placed on its own support by the Iowa Dept. of Transportation.

Determination of Type of Control

Yield signs are considered the default choice for traffic control at a passive crossing unless an engineering study or engineering judgment determines that a Stop sign is appropriate. A Stop sign establishes a legal requirement for each and every vehicle to come to a full stop. Indiscriminate use of the Stop sign at all or many passive grade crossings can cause poor compliance, increasing the risk of collisions associated with a high non-compliance rate. Therefore, the use of Stop signs at passive crossings should be limited to unusual conditions where requiring all vehicles to make a full stop is deemed essential by engineering study or judgment. The engineering study or engineering judgment should consider the following factors:

- The line of sight from an approaching highway vehicle to an approaching train as described in [6A-4 Horizontal Sight Distance at Intersections](#) of the Iowa DOT Design Manual;
- Characteristics of the highway, such as the functional classification, geometric conditions, and traffic volumes and speed;
- Characteristics of the railroad including, but not limited to, frequency, type and speed of trains, and number of tracks;
- Crossing crash history; and
- Need for active control devices.

Installation Details

When used at a passive crossing, the Yield or Stop sign shall be installed in conformance with the general principles and standards for sign installations in Part 2 and Part 8 of the MUTCD and with [Section 2A-8](#), [Section 2A-9](#) and [Section 2A-10](#) of the Traffic and Safety Manual. Examples of sign installation can be viewed at:

http://mutcd.fhwa.dot.gov/resources/policy/yieldstop_guidememo/yieldstop_policy.htm.

In addition, the following guidance can be considered for the installation of Yield or Stop signs at passive crossings:

When the Yield or Stop sign is installed on the same support as the Crossbuck sign, a strip of retroreflective material shall be used on the front and back of the support. The color of the retroreflective strip on the front of the support may be red (as per Section 2A.21) or white (as per Section 8B.03), while the color of the retroreflective strip on the back of the support shall be white.

The dimensions and placement of the retroreflective strips shall be in conformance with the standards in Section 8B.03.

Document Revision History: 12-12-05, 05-30-06, 10-02-06, 01-10-11



TRAFFIC AND SAFETY MANUAL

Chapter 2 – Signing 2B – Regulatory Signs

Speed Limit Signs

Originally Issued: 12-12-05, Last Revised: 12-12-05

General

Speed limits are established on primary highways and primary highway extensions upon the basis of an engineering and traffic investigation, commonly referred to as a speed study, as required by statute. The study is described in [Section 7C](#) of the Traffic and Safety Manual. Speed limit changes on primary highway extensions are made by the Iowa DOT, generally with concurrence of the city involved. The process for establishing speed limits is described in [Section 5A](#) of the Traffic and Safety Manual. Speed limit sign placement is covered in [Section 2A-8](#) of the Traffic and Safety Manual.

Statutory Speed Limits

Most speed limits on primary highway extensions have been established on the basis of a speed study, but in cases where no speed study has been conducted, the speed limit should be as stated in [Chapter 321.285 of the Iowa Code](#).

Park and Institutional Roads

The Iowa DOT is responsible for establishing and posting speed limits on extensions of primary highways through parks and institutions. For other state park and institution roads the controlling agency has jurisdiction and is responsible for establishing the speed limits. The Iowa DOT has a duty to maintain those roads, which may include sign installation. For further information about maintenance of State Park and Institutional Roads refer to Iowa DOT [Policy 800.04](#).

School Speed Limits

A School Speed Limit assembly shall be used to indicate the speed limit where a reduced speed zone for a school area or school crosswalk during certain time periods has been established by Staff Action. The assembly consists of a Speed Limit Sign Beacon, School plaque, Speed Limit sign and When Flashing plaque, to identify the time periods that the school speed limit is in effect. The end of the school speed zone should be marked with a End School Zone (S5-2) sign and a standard speed limit sign showing the speed limit for the section of highway that follows. The End School Zone sign and the speed limit sign will be installed in the same post with the speed limit sign installed to the left of the End School Zone sign. A School Advance Warning sign with supplemental Ahead plaque shall be used in advance of a School Speed Limit assembly. The State Traffic Engineer will provide assistance with the determination for use of school speed limits at the request of the District Office.

Minimum Speed Limit Signs

The minimum speed limit on the interstate system in Iowa is forty miles per hour. A minimum speed may also be established on divided multilane highways if warranted by engineering and traffic investigations and established by Staff Action. When used, the minimum speed limit sign shall be placed below the speed limit sign and shall not be used alone.

Document Revision History: 12-12-05



TRAFFIC AND SAFETY MANUAL

Chapter 2 - Signing 2B – Regulatory Signs

Alignment and Movement Signs

Originally Issued: 12-12-05, Last Revised: 04-23-07

General

The term, Alignment and Movement, for purposes of the Traffic and Safety Manual, is a way of categorizing signs that regulate turning movements; control turning movements from specific lanes; control passing movements; exclude certain types of vehicles; and control wrong way movements. Those signs are included in Sections 2B.17 through 2B.33 of the Manual on Uniform Traffic Control Devices ([MUTCD](#)).

Turn Prohibitions Signs

Turn prohibition signs are used where turns are prohibited. They are placed where they will be most easily seen by road users who might be intending to turn. They may be omitted where One Way signs are used or where the design of the intersection clearly indicates the one-way traffic movements.

As noted in [Administrative Rule Chapter 761, Section 150.4\(1\)](#) the Iowa DOT is not responsible for signs facing traffic on primary road extensions that regulate traffic movements on city cross streets (one-way traffic).

The Iowa DOT will provide and install No U-Turn signs on primary road extensions at locations where U-turns are prohibited by city ordinance as well as on primary roads where U-Turns may create a traffic hazard. No U-Turn signs are also used at freeway maintenance crossovers, mounted back to back on one side of the crossover in the center of the median.

Intersection Lane Control Signs

Intersection Lane Control signs indicate mandatory or optional movements required or allowed from a lane.

Mandatory Lane Control signs are normally omitted where turning bays have been provided and only the road users in such turning bays are permitted to make a similar turn. They may be used where the beginning of a turning bay could be mistaken for the beginning of a through lane. If used for this purpose the sign should be placed in advance of the intersection so that road users can select the appropriate lane. It should be placed either in advance of the taper or at the beginning of the turn lane.

Optional Movement Lane Control signs shall be used for two or more movements from a specific lane where a movement, not normally allowed, is permitted. The Optional Movement Lane Control Sign shall not be used alone to effect a turn prohibition. Advance intersection lane control signs should be used to indicate the configuration of all lanes ahead so that road users can select the appropriate lane.

Two-Way Left Turn Only Signs

Two-Way Left Turn Only signs are used, in conjunction with pavement markings, where a lane is reserved for the exclusive use of traffic in either direction as part of a left turn maneuver. The signs should be placed just beyond major intersections and at intervals of approximately twelve times the speed limit.

Do Not Pass Signs

The Do Not Pass sign may be used in addition to pavement markings to emphasize the restriction on passing. The Iowa DOT uses the Do Not Pass sign only where the pavement markings have been temporarily obliterated for surface maintenance purposes.

Pass With Care Signs

The Pass With Care sign is used at the end of a no-passing zone if a Do Not Pass sign has been installed at the beginning of the zone.

Slower Traffic Keep Right Signs

Slower Traffic Keep Right signs are used on the Interstate System just beyond ramps from rest areas to reduce unnecessary lane changing. They are also used at climbing lanes as shown on Figure 9a of [Section 3B-2](#) of the Traffic and Safety Manual. The signs for both applications are 36-inches by 48-inches in size.

Keep Right and Keep Left Signs

Keep Right signs are placed on, and as close as practical to approach ends of raised medians, islands, piers, and at other locations where it is not readily apparent that traffic is required to keep to the right. The sign should be mounted on the face of or just in front of a pier but may be placed well back from the approach end of a median to reduce the likelihood of being struck by a vehicle. Because the sign is viewed from a location considerably in advance of the median, it can be placed 50 to 75 feet back in rural areas or 10 to 30 feet in urban areas and yet present a proper perspective.

The Keep Right sign should be omitted at intermediate ends of divisional islands and medians unless special conditions indicate the need for the sign. It should also be omitted as shown on Figure 6 of [Section 3B-2](#) of the Traffic and Safety Manual. The Keep Right symbol sign is preferred for use rather than the word message with an arrow.

Where appropriate, a Keep Left sign is used rather than a Keep Right sign.

Do Not Enter Signs

The Do Not Enter sign is used where traffic is prohibited from entering a restricted roadway. It is used in conjunction with other signs to control wrong way movements at crossovers on divided highways as shown on Figures 10 – 29 of [Section 2A-10](#) of the Traffic and Safety Manual. It is also used at interchange exit ramps where the ramp intersects the crossroad in a manner that does not physically discourage or prevent wrong-way entry. The 36-inch size is used except when installed behind a 48-inch Stop sign, in which case the 30-inch size is used so that the shape of the stop sign is not compromised.

The Do Not Enter sign is used at channelized intersections to prevent wrong way movements as shown on Figure 1 of [Section 2A-10](#) of the Traffic and Safety Manual. The 30-inch size is used for this application.

Wrong Way Signs

The Wrong Way sign is used as a supplement to the Do Not Enter sign on interchange exit ramps. Two signs are normally placed on each ramp that does not physically discourage or prevent wrong-way entry. Placement is based on the configuration of the ramp with one sign normally installed on the back of the Stop Ahead or Signal Ahead sign and one on the other side of the ramp, generally opposite the destination sign.

Selective Exclusion Signs

Selective Exclusion signs give notice to road users that State or local statutes or ordinances exclude designated types of traffic from using particular roadways or facilities. Very few selective Exclusion signs are used on primary highways or primary road extensions. If an exclusion is governed by vehicle weight, a Weight Limit sign should be used instead of a Selective Exclusion sign.

Where a section of freeway without a minimum speed limit precedes a section of freeway or interstate with a minimum speed limit, a Selective Exclusion sign must be used to inform drivers of slow moving vehicles that they must exit the freeway. The sign legend is “Vehicle Speed Less Than 40 MPH Must Exit”. The sign is placed on both sides of the road in advance of the last opportunity to exit. Similar signs with the legend “Vehicle Speed Less Than 40 MPH Prohibited” are placed on entrance ramps at the interchange preceding the section with the minimum speed limit.

One Way Signs

The One Way sign is used in conjunction with other signs to control wrong way movements at crossovers on divided highways as shown on Figures 10 – 29 of [Section 2A-10](#) of the Traffic and Safety Manual. It is also used where an exit ramp intersects a crossroad in a manner that does not physically discourage or prevent wrong-way entry. At un-signalized intersections, One Way signs shall be placed on the near right and far left corners of the intersection. At signalized intersections, One Way signs shall be placed either near the appropriate signal faces, on the poles holding the traffic signals, on the mast arm or span wire holding the signals, or at the locations specified for un-signalized intersections. As noted in [Administrative Rule Chapter 761, Section 150.4\(1\)](#) the Iowa DOT is not responsible for signs facing traffic on primary road extensions that regulate traffic movements on city cross streets (one-way traffic).

Divided Highway Crossing Signs

The Divided Highway Crossing sign is used to advise drivers that they are approaching an intersection with a divided highway. It is used in conjunction with other signs to control wrong way movements at crossovers on divided highways as shown on Figures 10 – 29 of [Section 2A-10](#) of the Traffic and Safety Manual.

Document Revision History: 12-12-05, 04-23-07



TRAFFIC AND SAFETY MANUAL

Chapter 2 - Signing 2B – Regulatory Signs

Other Regulatory Signs

Originally Issued: 12-12-05, Last Revised: 04-23-07

General

There are a number of regulatory signs that do not fit into broad categories of signs, including Pedestrian signs, Traffic Signal signs, Highway-Rail Grade Crossing signs, Road Closed signs, Weight Limit signs, Hazardous Cargo signs, Preferential Lane signs, Truck Route signs and Seat Belt Usage signs.

Regulatory word message signs other than those classified and specified in the MUTCD and the “Standard Highway Sign” book may be developed to aid the enforcement of other laws or regulations. The State Traffic Engineer will provide assistance with sign design at the request of the District Office.

Traffic Signal Signs

To supplement traffic signal control, Traffic Signal signs may be used to regulate road users as discussed in [MUTCD Section 2B.40](#). The Left Turn Yield on Green (symbolic green ball) sign is used where left-turning traffic is controlled by a green arrow indication or a circular green ball, depending on time of day or other factors. The Left Turn Signal sign is used where the indications of a separate left turn signal face controlling only a separately-controlled left turn lane will also be visible to traffic with other allowable movements. The No Turn On Red sign may be used to prohibit turns on red when one or more of five conditions listed in [MUTCD Section 2B-40](#) exists.

Traffic signal signs applicable to pedestrians shall be used as described in [MUTCD Section 2B-40](#).

Highway-Rail Grade Crossing Signs

The Crossbuck sign and Number of Tracks sign are placed by the Rail Company as stated in [MUTCD Section 8B.02](#). The regulatory Exempt sign may be provided by the Iowa DOT and installed by the Rail Company. The [Code of Iowa Section 321.343](#), states “An exempt sign shall be posted only where the tracks have been partially removed on either side of the roadway”.

- If continuous rails are in place, even if the rail line is no longer in use, crossbucks, warning signs and markings are to be in place and the Exempt sign is not to be used.
- If the crossing has been removed or covered or if all rails including the crossing have been removed all signs and markings should be removed.
- If there are rails at the crossing only and the rails in both directions have been removed, the crossbucks, warning signs and pavement markings are to remain in place and Exempt signs should be in place.

Whenever engineering judgment determines that the potential for vehicles stopping on the tracks is high, a Do Not Stop On tracks sign should be used as stated in [MUTCD Section 8B.06](#).

Road Closed Signs

Road Closed, Road Closed To Thru Traffic and Local Traffic Only signs shall be used as described in [Standard Road Plan TC-252](#). The Road Closed sign is used at the physical closure of the road. The Road Closed (10) Miles Ahead Local Traffic Only is used where the road is closed some distance beyond the sign and is usually accompanied by a Detour sign. The Road Closed To Thru Traffic sign is used at the last intersection where traffic can turn off or turn around.

Weight Limit Signs

Several methods of posting weight limits are in use on Iowa highways, due to the variance of situations involved. The most common situation is one in which the gross weight of the vehicle is restricted depending on the vehicle configuration. In this case the weight limits are posted at the bridge as well as at an approach intersection where restricted vehicles can detour or turn around. [Policy 610.03](#) of the Policies and Procedures Manual gives the procedures for imposing and terminating bridge closures, embargoes and other restrictions on bridges.

[Policy 610.05](#) gives the procedures for establishing and terminating weight limits on primary highways. This policy provides for a ninety-day embargo of highways that because of deterioration, rain, snow or other climatic conditions may be seriously damaged or destroyed by vehicles of legal weight. The sign, Road Closed to Vehicles Over (10) Tons is placed on both ends of the embargoed section where restricted vehicles can detour or turn around and at major intersecting roads.

Weigh Station Signs

On 2-lane or four-lane undivided highways there are four basic signs for weigh stations:

- Weigh Station ½ Mile
- Trucks Over 10,000 lbs. Must Weigh
- Weigh Station with a Closed/Open changeable message
- Weigh Station with right or left arrow

All four signs have a black message on a white background.

On divided highways, signs similar to those used for interchanges and rest areas are used for weigh station signing:

- Weigh Station 1 Mile
- All Trucks Over 10,000 lbs Must Weigh
- Weigh Station Next Right
- Weigh Station with right diagonal arrow placed in gore of ramp

The signs have a white message on a green background except that the All Trucks Over 6000 lbs Must Weigh sign has a black message on a white background.

Truck Route Signs

The Truck Route sign is used to mark a route that has been designated to allow truck traffic. All primary highways and extensions in cities are truck routes and need not be signed. Where a city has designated and signed a truck route, the primary road extension may be included if needed for continuity. The signs are provided and installed by the city.

Seat Belt Signs

The Iowa seat belt sign used to alert motorists that Iowa has a seat belt law is Buckle Up For Life It's Our Law with a symbol belt and buckle. The signs have a black message on a white background. They are placed at locations selected by the Office of Traffic and Safety.

Engine Brake Ordinance Enforced Signs

When a county or city has passed an ordinance regarding the use of engine brakes within their jurisdiction and wishes to have signs placed on a primary highway, the Iowa DOT will provide and place the signs at or near the county line or corporate limit.

Unlawful to Pass Stopped School Bus Signs

There are two types of signs to remind motorists of the fact that it is unlawful to pass a stopped school bus. The Unlawful To Pass Stopped School Bus sign is used on multilane divided highways. The Unlawful To Pass Stopped School Bus From Either Direction sign is used on two-lane highways. Both types are placed in the series of signs at state border crossings and for traffic leaving cities over 1000 population as shown on Figure 6 of [Traffic and Safety Manual Section 2A-10](#).

\$70 Fine For Disposal of Litter On Highway

\$70 Fine For Disposal Of Litter On Highway signs are used to inform unfamiliar motorists of the regulation. They are placed in the series of signs at state border crossings and for traffic leaving cities over 1000 population as shown on Figure 6 of [Traffic and Safety Manual Section 2A-10](#).

Bicycle Signs

Guidance for application and placement of bicyclist traffic control devices may be found in [MUTCD Part 9](#) Traffic Control for Bicycle Facilities.

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TRAFFIC AND SAFETY MANUAL

Chapter 2 - Signing 2C - Warning

Roadway Related Signs

Originally Issued: 12-16-05, Last Revised: 04-23-07

Changes in Horizontal Alignment Signs

Warning of changes in horizontal alignment of a section of highway is provided by the use of Horizontal Alignment signs, Combination Horizontal Alignment/Advisory Speed signs, Combination Horizontal Alignment/Intersection signs, One Direction Large Arrow signs and Chevron Alignment signs.

Horizontal Alignment Signs

The Turn warning sign or Reverse Turn warning sign is used if the advisory speed as determined by a curve speed study as described in [Section 7B-1](#) of the Traffic and Safety Manual is 30 MPH or less and is equal to or less than the speed limit.

The Curve or Reverse Curve sign is used if the advisory speed as determined by a ball bank study is greater than 30 MPH and equal to or less than the speed limit. The Curve or Reverse Curve sign is not needed for curves of 4 degrees of curvature or less. Curve or Reverse Curve signs are needed for curves of 8 degrees of curvature or greater. The need for a Curve or Reverse Curve sign for curves between 4 and 8 degrees of curvature is determined by a ball bank study. If the ball bank study results in a number of 5 or more on the ball bank indicator at the posted speed limit, use of a Curve or Reverse Curve sign is indicated.

The reverse Turn or Reverse Curve sign is used where two turns or curves are in opposite directions and separated by 600 feet or less. The Winding Road sign is used where there are three or more changes in alignment that are not separated by more than 600 feet and where the first two are in opposite directions. A sign that depicts the direction of the first change of alignment is used in all three cases.

An Advisory Speed Plaque is used when a curve speed study as described in [Section 7B-1](#) of the Traffic and Safety Manual results in an indicated speed equal to or less than the speed limit.

Combination Horizontal Alignment/Advisory Speed Signs

Under certain limited circumstances the Turn sign or Curve sign may be combined with the Advisory Speed plaque to create a combination Horizontal Alignment/Advisory Speed sign. The State Traffic Engineer will provide assistance for use of this sign at the request of the District Office. The Curve Speed sign described in [Section 2C.02](#) of the Traffic and Safety Manual may also be appropriate for certain applications. The State Traffic Engineer will provide assistance for the use of this sign at the request of the district Office.

Combination Horizontal Alignment/Intersection Signs

Under certain circumstances the Curve sign may be combined with the Cross Road or Side Road sign to create a combination Horizontal Alignment/Intersection sign that depicts the

condition where an intersection occurs with a turn or curve. The State Traffic Engineer will provide assistance for use of this sign at the request of the District Office.

One-Direction Large Arrow Signs

A One-Direction Large Arrow sign may be used to delineate a change in horizontal alignment. If used, the One-Direction Large Arrow sign shall be installed on the outside of a turn or curve in line with and at approximately a right angle to approaching traffic. The One-Direction Large Arrow sign is only used where the need has been determined by an engineering study.

Chevron Alignment Signs

The Chevron Alignment Sign may be used to provide additional emphasis and guidance for a change in horizontal alignment. It may be used on curves as an alternate or supplement to standard delineators or to the Large Arrow sign. Spacing of Chevron alignment signs should be such that the road user always has at least two in view, until the change in alignment eliminates the need for the signs. Chevron Alignment signs are used only where the need has been determined by an engineering study. [Standard Road Plan RD-34](#) should be used as a guide for placement and installation. The publication [Iowa Traffic Control Devices and Pavement Markings: A Manual for Cities and Counties](#) from the Center for Transportation Research and Education may be used for further guidance.

Vertical Alignment Signs

Warning of changes in vertical alignment of a section of highway is provided by the use of Hill signs. The Hill symbol sign is used in advance of a downgrade where the length, percent of grade, horizontal curvature, and/or other physical feature requires special precautions on the part of road users. The Hill symbol sign and supplemental grade plaque should be used in advance of downgrades for the conditions listed in [MUTCD Section 2C.11](#). The State Traffic Engineer will provide assistance at the request of the District Office.

Cross Section Signs

Pavement Narrows Signs

The Pavement Narrows sign is used in advance of a transition on two-lane roads where the pavement width is reduced sharply by two feet or more.

Narrow Bridge Signs

A Narrow bridge sign should be used in advance of a bridge or culvert having a roadway clearance less than the width of the approach travel lanes. Additional emphasis should be provided by the use of object markers as provided in Office of Maintenance [Instructional Memorandum 4.112](#) and pavement markings as shown in [Figure 8 of Section 3B-2](#) of the Traffic and Safety Manual.

One Lane Bridge Signs

A One Lane Bridge sign shall be used on two-way roadways in advance of any bridge or culvert having an approach roadway of 18 feet or less. Additional emphasis should be provided by the use of object markers and pavement markings. The State Traffic Engineer will provide assistance at the request of the District Office.

Divided Highway Signs

A Divided Highway symbol sign should be used on the approaches to a section of highway (not an intersection or junction) where opposing flows of traffic are separated by a median or other physical barrier as shown on [Standard Road Plan TC-62](#).

Divided Highway Ends Signs

A Divided Highway Ends sign should be used at the end of a section of physically divided highway (not an intersection or junction) as a warning of two-way traffic ahead as shown on [Standard Road Plan TC-62](#).

Double Arrow Signs

A Double Arrow sign may be used to advise road users that traffic is permitted to pass on either side of an island, obstruction, or gore in the roadway. This sign can be useful at the gore of a wye type intersection or at the gore formed by the beginning of an entrance ramp.

Dead End and No Outlet Signs

A Dead End sign may be used at the entrance of a single road or street that terminates in a dead end or cul-de-sac. A No Outlet sign may be used at the entrance to a road network from which there is no other exit. The Dead End or No Outlet sign is normally placed just beyond the last intersection permitting the road user to avoid the dead end or no outlet condition.

Low Clearance Signs

The Low Clearance sign shall be placed in advance of the structure to warn road users of clearances less than 12 inches above the statutory maximum vehicle height of 13-feet 6-inches. The actual clearance, reduced by 3 inches to allow for frost action, shall be shown for all bridges that are 14-feet 9-inches or less in height. A rectangular sign shall also be placed on the structure. Where the actual clearance is equal to or less than 13-feet 9-inches, the legal limit plus 3 inches to allow for frost action, a Low Clearance sign with a supplemental distance plaque shall also be placed at the nearest intersecting road at which a vehicle can detour or turn around.

The clearance must be re-measured when new construction or other events that change the clearance over any open road take place to ensure that the proper signs are in place and that any new clearance has been reported and posted.

Roadway Surface Condition Signs

Bump and Dip Signs

Bump and Dip signs are used to give advance warning of a sharp rise or depression in the profile of the road. These signs may be supplemented with an advisory speed plaque. A Bump or Dip sign is also placed adjacent to the bump or dip and is supplemented by a downward diagonal arrow below the Bump or Dip sign. Bump and Dip signs are not to be used at rough highway-rail grade crossings.

Speed Hump Signs

Speed Hump signs should be used to give warning of a vertical deflection in the roadway that is designed to limit the speed of traffic. It should be supplemented with an advisory speed plaque.

Rough Crossing Signs

Rough Crossing signs are used to give advance warning of rough highway-rail grade crossings. The sign is placed one third of the distance between the Highway-Rail Grade Crossing Advance Warning sign and the stop line. The Rough Crossing sign is to be supplemented with an advisory speed plaque. Two red metal flags are to be placed above the Rough Crossing sign when the speed limit is 45 M.P.H. or more and the advisory speed is at or below 25 M.P.H.

Pavement Ends Signs

A Pavement Ends sign should be used in advance of a location where a paved surface changes to a granular surface. An advisory speed plaque may be used when the change in roadway condition requires a reduced speed.

Shoulder Signs

A Soft Shoulder sign is used to warn of a soft shoulder condition. A No Shoulder sign is used to warn that the shoulder is two feet or less in width.

Slippery When Wet Signs

The Slippery When Wet sign is used to warn that a slippery condition may exist. It is installed when indicated by test results as described in Policy 600.1, Pavement Friction and Uneven Pavement Surface Program, in the Policies and Procedures Manual.

Falling Rock Signs

The Falling Rock sign is used in locations where cuts have been made through terrain containing rock that tends to become dislodged and fall to the shoulder or pavement surface.

Other Roadway Related Warning signs

Freeway Ends Signs

Special Freeway Ends signs are used where a freeway ends and all traffic must exit. They are not used where a freeway ends and an expressway or conventional road begins. The State Traffic Engineer will provide assistance at the request of the District Office.

Document Revision History: 12-16-05, 04-23-07



TRAFFIC AND SAFETY MANUAL

Chapter 2 - Signing 2C - Warning

Traffic Related Signs

Originally Issued: 12-16-05, Last Revised: 10-13-06

Advance Traffic Control Signs

The Advance Traffic Control signs include the Stop Ahead, Yield Ahead and Signal Ahead signs. The Stop Ahead sign is used in advance of all Stop signs on primary highways. The Yield sign is used at select locations. The State Traffic Engineer will provide assistance for use of this sign at the request of the District Office.

Signal Ahead signs are used on exit ramps controlled by signals. As a general rule it is also used on primary highways at the first signal approaching a highway section with signalized intersections. It is also used on an approach to a signal that is not visible for a sufficient distance to permit the road user to respond to the signal. The visibility criterion is based on having a continuous view of at least two signal faces for the distance specified in [MUTCD Part 4, Table 4D-1](#).

Be Prepared To Stop Signs

A Be Prepared To Stop sign may be used to warn of stopped traffic caused by traffic control signals or in areas that regularly experience traffic congestion.

Speed Reduction Signs

A Speed Reduction sign is used to inform road users of a reduced speed zone as described in [Section 2A-8](#) of the Traffic and Safety Manual.

Traffic Flow Signs

Merge Signs

A Merge sign is used to warn drivers on a major roadway that merging movements might be encountered where lanes from two separate roadways converge as a single traffic lane. The most common example for use of this sign is on a divided highway in advance of an entrance ramp. It may also be used at a large channelized intersection. The Merge sign is installed on the side of the major roadway where merging traffic will be encountered.

Added Lane Signs

An Added Lane sign is used in advance of a point where two roadways converge and merging movements are not required. It is used on both roadways on the side from which the other roadway approaches. It can be modified as appropriate for the number of lanes involved.

Lane Ends Signs

A Lane Ends symbol sign is used to warn of the reduction in the number of traffic lanes in the direction of travel on a multilane highway. A Right (Left) Lane Ends sign is used in advance of the Lane Ends symbol sign, depending on which lane ends. If longitudinal space is not available,

the Right (Left) Lane Ends sign may be eliminated. The signs are used where an extra lane has been added as shown in Figure 9a of [Section 3B-2](#) in the Traffic and Safety Manual.

Two-Way Traffic Signs

A Two-Way Traffic sign is used to warn road users of a transition from a multilane divided section of roadway to a two-lane, two-way section of roadway. It normally follows the Divided Highway Ends sign.

No Passing Zone Signs

A No Passing Zone sign is used on the left side of the roadway at the beginning of a no passing zone identified by pavement markings.

School Bus Stop Ahead Signs

The School Bus Stop Ahead sign is used in advance of locations where a school bus, stopped to load or discharge passengers, is not visible for a distance that is adequate for a road user to have ample time to react to the presence of the bus. This distance is determined from a study described in [Section 7G-3](#) of the Traffic and Safety Manual. It shall have a fluorescent yellow-green background with a black legend and border. The school should be involved since they may be willing to change an operation to mitigate the problem. The location should be monitored to ensure that the sign is removed when no longer needed.

Change in Speed Signs

Advisory Exit, Ramp and Curve Speed signs shall be used where a curve speed study described in [Section 7B](#) of the Traffic and Safety Manual indicates the need to advise road users of the recommended speed on an exit, a ramp, or a curve.

Exit Speed Signs

The Exit Speed sign is used along the deceleration lane at an interchange. It must be visible in time for a road user to make a safe slowing and exiting maneuver.

Ramp Speed Signs

The Ramp speed sign is used along the ramp itself in advance of a location where the ramp speed becomes lower than the exit speed. The Ramp sign is also used instead of an Exit sign where the ramp is used to remain on the route number being followed.

Curve Speed Signs

The Curve Speed sign is used at and beyond the beginning of a curve following a Horizontal Alignment and Advisory Speed combination, or when there is a need to remind road users of the recommended speed, or where the recommended speed changes because of a change in curvature. The State Traffic Engineer will provide assistance for use of this sign at the request of the District Office.

Intersection Signs

Cross Road and Side Road Signs

Intersection warning signs are most often used at locations where the sight distance is less than the minimum for intersection design. It is appropriate to place a Cross Road or Side Road warning sign where the study described in section 7G-2 of the Traffic and Safety Manual indicates that the available sight distance is less than desirable for that location. If it is decided to

use a warning sign for a driveway, a rectangular sign with the legend Driveway is to be placed under the Cross Road or Side Road symbol sign.

Two-Direction Large Arrow signs

The Two-Direction Large Arrow sign is installed on the far side of a T-intersection in line with and at approximately a right angle to approaching traffic. The sign should be installed well back from the edge of pavement, on the order of 30 feet or more if possible.

Other Intersection Warning Signs

Certain other signs such as Turning Traffic Ahead, Watch For Turning Traffic or Turning Trucks Ahead may be appropriate depending on the situation. A Supplemental Plaque with a street name or distance may be used as well. The State Traffic Engineer will provide assistance for use of such signs at the request of the District Office. Parallel Highway-Rail Grade Crossing Signs

If the distance between the railroad tracks and the parallel highway, from the edge of the tracks to the radius of the highway intersection, is less than 100 feet, the Parallel Highway-Rail Grade Crossing sign shall be placed on the parallel highway. Sign placement is in accordance with [Traffic and Safety Manual 2A-8](#) Table 1 for the turning maneuver speed.

Highway-Rail Grade Crossing Signs

A Highway-Rail Grade Crossing sign shall be used on each highway in advance of every highway-rail grade crossing except in certain circumstances listed in MUTCD Section 8B.04. The State Traffic Engineer will provide evaluation assistance at the request of the District Office.

If the distance between the railroad tracks and the parallel highway, from the edge of the tracks to the radius of the highway intersection, is less than 100 feet, the Parallel Highway-Rail Grade Crossing sign shall be placed on the parallel highway. Sign placement is in accordance with [Traffic and Safety Manual 2A-8](#) Table 1 for the turning maneuver speed.

If the highway profile conditions are sufficiently abrupt to create a hang-up situation for long wheelbase vehicles or for trailers with low ground clearance, the Low Ground Clearance Highway-Rail Grade Crossing sign should be installed in advance of the highway-rail grade crossing. This situation could occur on a crossroad near the highway. In this case the Low Ground Clearance Highway-Rail Grade Crossing sign is used in conjunction with the Parallel Highway-Rail Grade Crossing sign. The State Traffic Engineer will provide assistance for use of this sign at the request of the District Office.

Motorized Traffic Signs

Motorized Traffic signs are used to alert road users to locations where unexpected entries into the roadway by farm vehicles, emergency vehicles, snowmobiles or other vehicles might occur. The signs should primarily be used only at locations where the road user's sight distance is restricted. Motorized Traffic signs should not normally be used at intersections since road users are expecting cross traffic at intersections. It may be appropriate, however, to install Emergency Vehicle signs if visibility of approaching emergency vehicles is restricted at an intersection frequently used by emergency vehicles from a nearby station.

Nonvehicular Traffic Signs

Nonvehicular signs may be used to alert road users of locations where unexpected entries into the roadway by pedestrians, bicyclists, golf carts, animals, waterfowl, horse-drawn vehicles, etc. might occur. When used at a crossing, the Nonvehicular warning sign shall be supplemented with a diagonal downward pointing arrow plaque showing the location of the crossing. The decision regarding the use of a Nonvehicular sign is based on engineering judgment but it should be used only at locations where the crossing activity is significant and unexpected or not readily apparent.

Deer Signs

Deer signs are installed where suggested by the general public on highway sections having at least three times the statewide average number of deer per mile being killed by vehicles in the previous three calendar years. The listing of deer killed and current rate is maintained by the Office of Traffic and Safety.

Playground Signs

The Playground sign may be used to give advance warning of a designated children's playground located next to a primary highway or primary highway extension. It shall have a fluorescent yellow-green background with a black legend and border.

School Signs

Warning signs used in the vicinity of schools and at established school route crosswalks should be utilized in accordance with [Part 7 of the MUTCD](#). The standard size (36 x 36 in.) shall be used on conventional roads and the special size (48 x 48 in.) shall be used on expressways. They shall have a fluorescent yellow-green background with a black legend and border.

School Advance Warning Assemblies

The School (S1-1) sign shall be installed at every school district, where the school house is within 200ft of the highway. The school (S1-1) sign shall be supplemented with a school (S4-3P) plaque.

The School Advance Warning sign supplemented with a plaque with the word Ahead shall be used in advance of school crosswalks. It shall also be used in advance of School Speed Limit Assemblies. It shall not be used on an approach controlled by a permanent stop sign.

The School Advance Warning Assembly may be omitted where a School (S1-1) sign and supplemental SCHOOL plaque is installed in advance of the school crossing.

School Crosswalk Warning Assemblies

The School Crosswalk Warning Assembly consists of a School Advance Warning Sign supplemented with a diagonal downward pointing arrow plaque. It shall be used on Primary Highways at marked crosswalks adjacent to schools and on established school routes. The School Crosswalk Warning Assembly shall not be used on an approach controlled by a permanent stop sign but shall be used in conjunction with a portable stop sign as provided by [Administrative Rule Chapter 761, Section 130.1\(1\)](#). It shall be used at established school crossings at signalized intersections.

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