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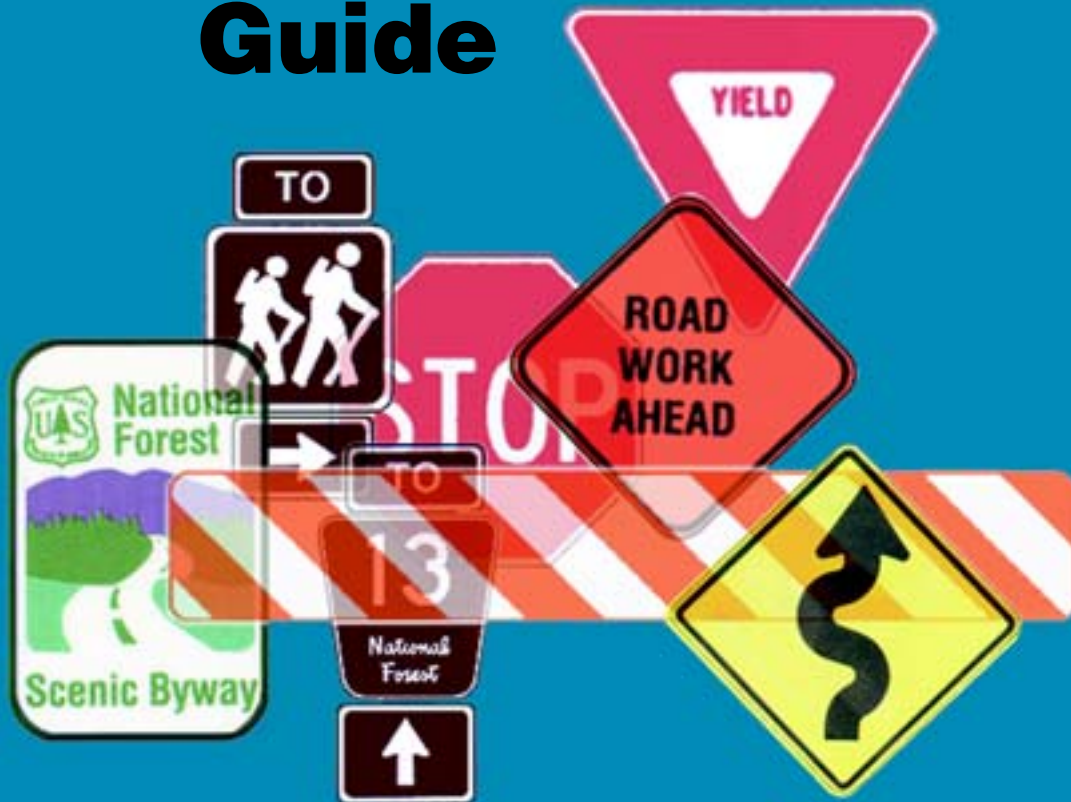
Forest Service

Technology &
Development
Program

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Sign Installation Guide



Thanks to:

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Trent, Andy; Sheehy, Donna. 2003. Sign Installation Guide. Tech. Rep. 0371-2812-MTDC. Missoula, MT: U.S. Department of Agriculture, Forest Service, Missoula Technology and Development Center. 18 p.

Includes 18 color photographs showing the specifications for placing signs along Forest Service roads. Intended to help new employees or volunteers install road signs.

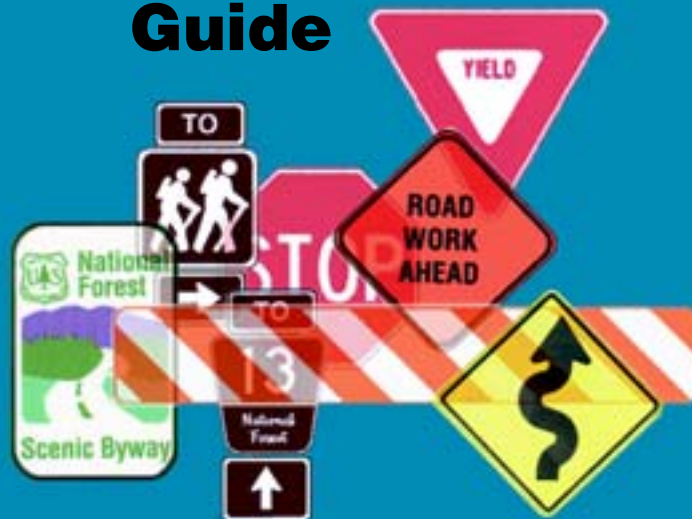
Keywords: road signs, specifications, standards.

Some photographs in this manual have been digitally altered to remove distracting features.

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Sign Installation Guide



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6E62H99—Sign Installation Field Guide

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Installation Notes

Proper location, position, and erection of signs is very important. The effectiveness of a sign can be compromised if it is not installed correctly. A sign that is confusing, or one that a driver cannot see in time, is useless. This guide contains information needed to install traffic control signs on National Forest System Roads (NFSR) in accordance with the *Manual of Uniform Traffic Control Devices* (MUTCD) and EM-7100-15, *Sign and Poster Guidelines for the Forest Service*. It provides a quick visual reference to field personnel placing and maintaining the most often used signs and markers. It does not include every type sign or marker used, but should give contractors, cooperators, volunteers, and Forest Service personnel a clear picture of how signs should be installed.

Before any signs are installed on the ground, this guide assumes that:

- A sign plan has been completed and approved that determines appropriate sign messages and correct locations according to Chapter 3, EM-7100-15.
- Engineering judgment has been used in determining the need for and placement of all regulatory and warning signs.
- All traffic control signs meet MUTCD and Forest Service standards.

Uniform positioning of signs is highly desirable. However, because no two roads or situations are exactly alike, standards and guidelines may need to be modified to fit the sign to the road.

This guide should be kept in the glove box of vehicles used by personnel installing signs. A quick check of the guide should ensure far fewer errors in installations. The guide is not intended to serve as a substitute for training, but is intended to help trained personnel charged with installing and maintaining signs.

Refer to *Manual on Uniform Traffic Control Devices* and EM-7100-15, *Sign and Poster Guidelines for the Forest Service*, for complete information.

Typical Installations

Low-volume rural roads

State and county requirements may vary. Check with local jurisdiction when installing signs on county, State, or Federal roads.

A written agreement must be in place to install signs on other jurisdictions.

Use 7 ft min. (secondary sign 6 ft min.) in:

- Urban areas
- Business, commercial, or residential areas
- Parking or pedestrian movement areas
- Areas with view obstructions

Signs should not obscure each other or be hidden from view by other objects. Avoid locations such as:

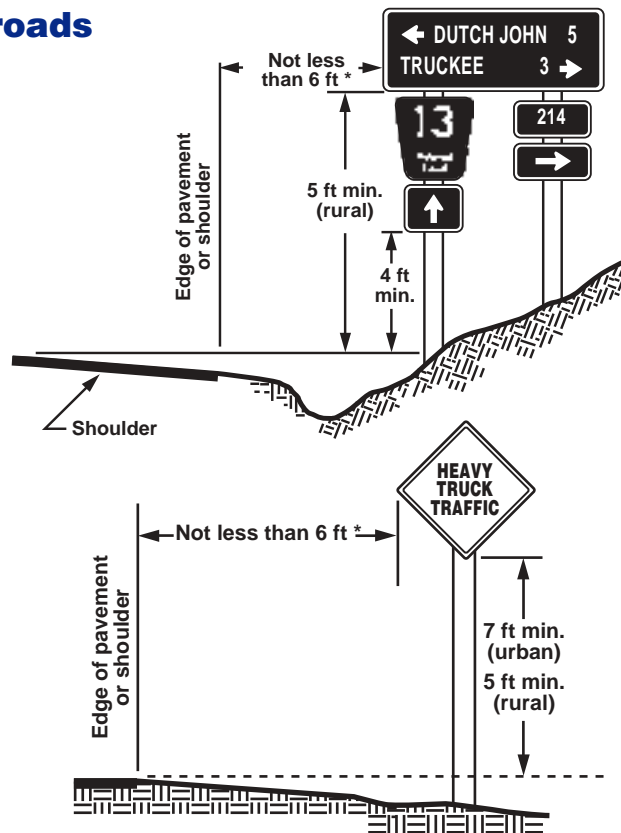
- Dips in the road
- Just beyond the crest of a hill
- Where sign may interfere with normal operation of facility
- Trees and foliage that could cover sign
- Snow removal areas

Signs should be erected on separate posts except where one sign supplements another or where route or directional signs must be grouped.

Mount top of sign flush with top of post. A 1-in gap is allowable between multiple (stacked) signs to allow for expansion/contraction.

Locate signs on right-hand side of the road unless specific standards require otherwise.

*On **low-volume roads** (fewer than 400 vehicles per day) a lateral offset of not less than 2 ft from the roadway edge to the roadside edge of a sign may be used where roadside features such as terrain, shrubbery, and/or trees prevent standard lateral placement.

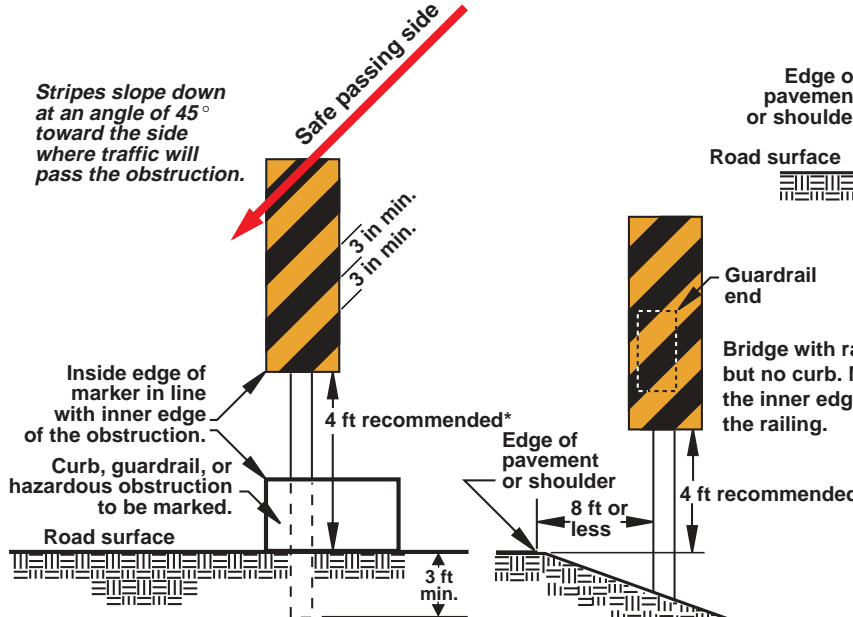


Typical Marker Installations

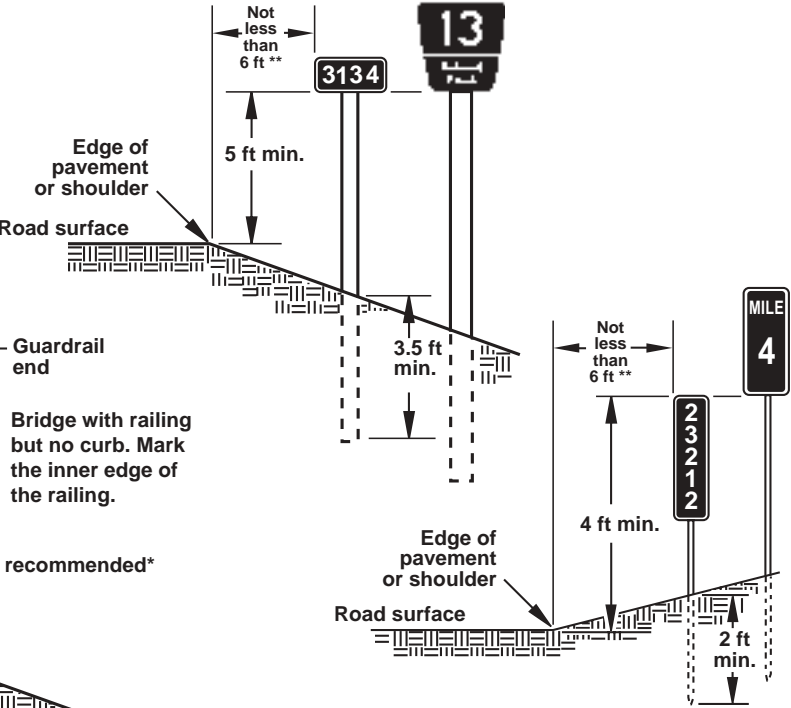
Route Markers

Object Markers

Stripes slope down at an angle of 45° toward the side where traffic will pass the obstruction.

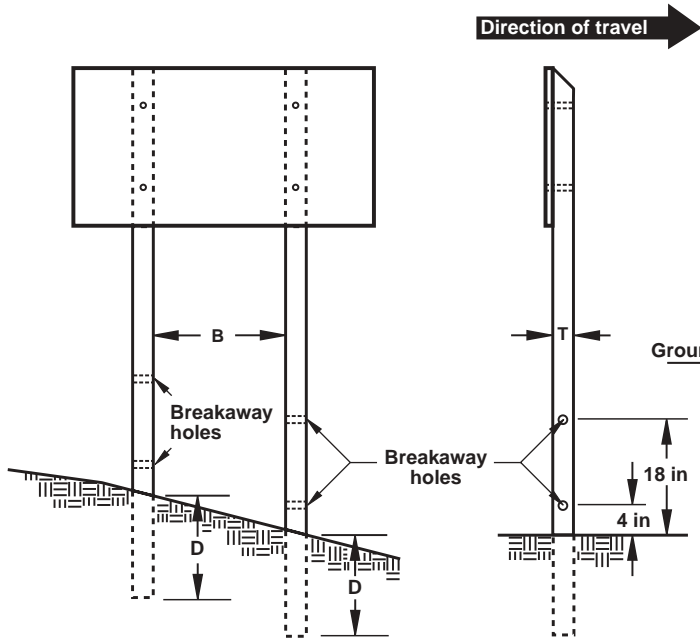


*Vertical mounting height may vary according to need when an object requires a lower or higher mounting height. Do not mount lower than 6 in.

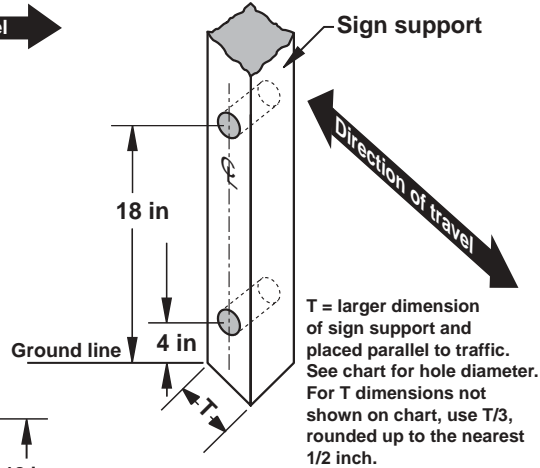


**Not less than 2 ft for low volume roads

Wooden Breakaway Sign Support Guidelines



Typical Breakaway Support



Typical Hole Spacing Detail

Breakaway design is required for all posts (new and existing) with a cross-sectional area of 24 square inches or more, whenever the installation is within the traffic runoff area.

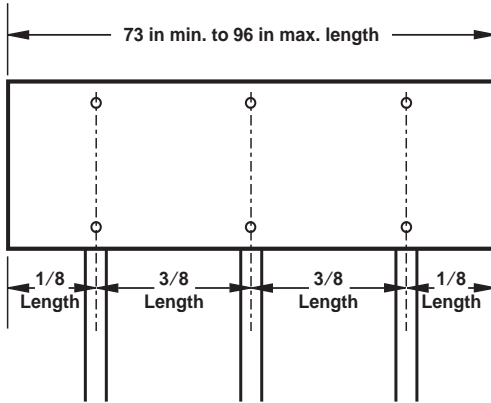
Breakaway holes must be perpendicular to direction of vehicle travel. Dimension T is parallel to direction of vehicle travel and is the larger of the dimensions.

Field drill posts and treat holes with preservative.

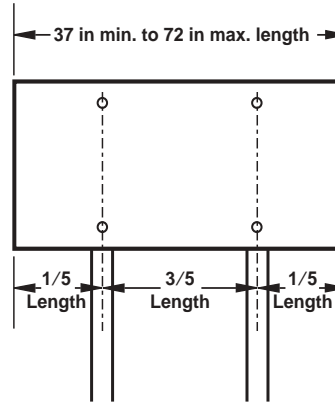
| Breakaway design post sizes | | | |
|-----------------------------|--------------------|----------------------|-----------------------------------|
| Post size (in) | Hole diameter (in) | D minimum depth (ft) | B minimum breakaway distance (ft) |
| 4 x 4 | None | 3 | — |
| 4 x 6 drilled | 1.5 | 4 | — |
| 6 x 6 drilled | 2 | 4 | 7 |
| 6 x 8 drilled | 3 | 4 | 7 |

Typical Post Spacing and Size Requirements

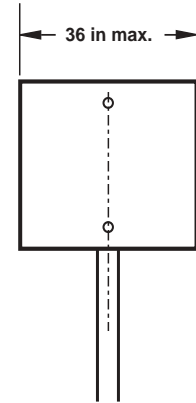
Nonbreakaway Installations



Typical Three-Post Detail



Typical Two-Post Detail



Typical Single-Post Detail

Spacing applies only for signs that have not been predrilled.

Nonbreakaway signs should be installed outside the clear zone, behind a guardrail or a nontraversable ditch.

Maximum Board Size Relationship

| Post Size (in) | Maximum sign area (sq. ft) | | | |
|----------------|----------------------------|---------|---------|---------|
| | 1 sign | 2 signs | 3 signs | 4 signs |
| 4 x 4 | 10 | 20 | — | — |
| 4 x 6 | 15 | 35 | 45 | — |
| 6 x 6 | 20 | 50 | 75 | 100 |

Advance Sign Placement Distances

Minimum Placement Distances

Regulatory signs—Place at or before the point the prohibition begins.

Signs are to be placed where they provide adequate time for response, considering such things as approach speed, road conditions, etc.

Warning signs—Place in advance of the condition using the following table.

Wet pavement or gravel—24- x 24-in signs

| 85 percent speed or posted speed (mph)* | 1 Condition requires a stop (ft) | 2 Condition requires deceleration to advisory speed listed (mph) | | | | Additional distance on down grade (percent) | | | |
|---|----------------------------------|--|-----|-----|-----|---|----|-----|-----|
| | | 10 | 20 | 30 | 40 | 3 | 6 | 9 | 12 |
| | | (ft) | | | | (ft) | | | |
| 20 | nsm** | nsm | — | — | — | 5 | 10 | 20 | 30 |
| 25 | nsm | 150 | — | — | — | 8 | 15 | 30 | 45 |
| 30 | 150 | 200 | 150 | — | — | 10 | 20 | 45 | 65 |
| 35 | 200 | 250 | 225 | — | — | 15 | 35 | 60 | 90 |
| 40 | 275 | 325 | 300 | 275 | — | 20 | 45 | 75 | 120 |
| 45 | 350 | 400 | 350 | 300 | — | 25 | 55 | 95 | 150 |
| 50 | 425 | 475 | 450 | 375 | 275 | 30 | 70 | 120 | 185 |
| 55 | 500 | 550 | 525 | 450 | 350 | 35 | 85 | 145 | 225 |

1 Driver may be required to come to a complete stop (such as stop signs or pedestrian crossings).

2 Driver will probably be required to decrease speed (such as advisory speed for a curve or intersection).

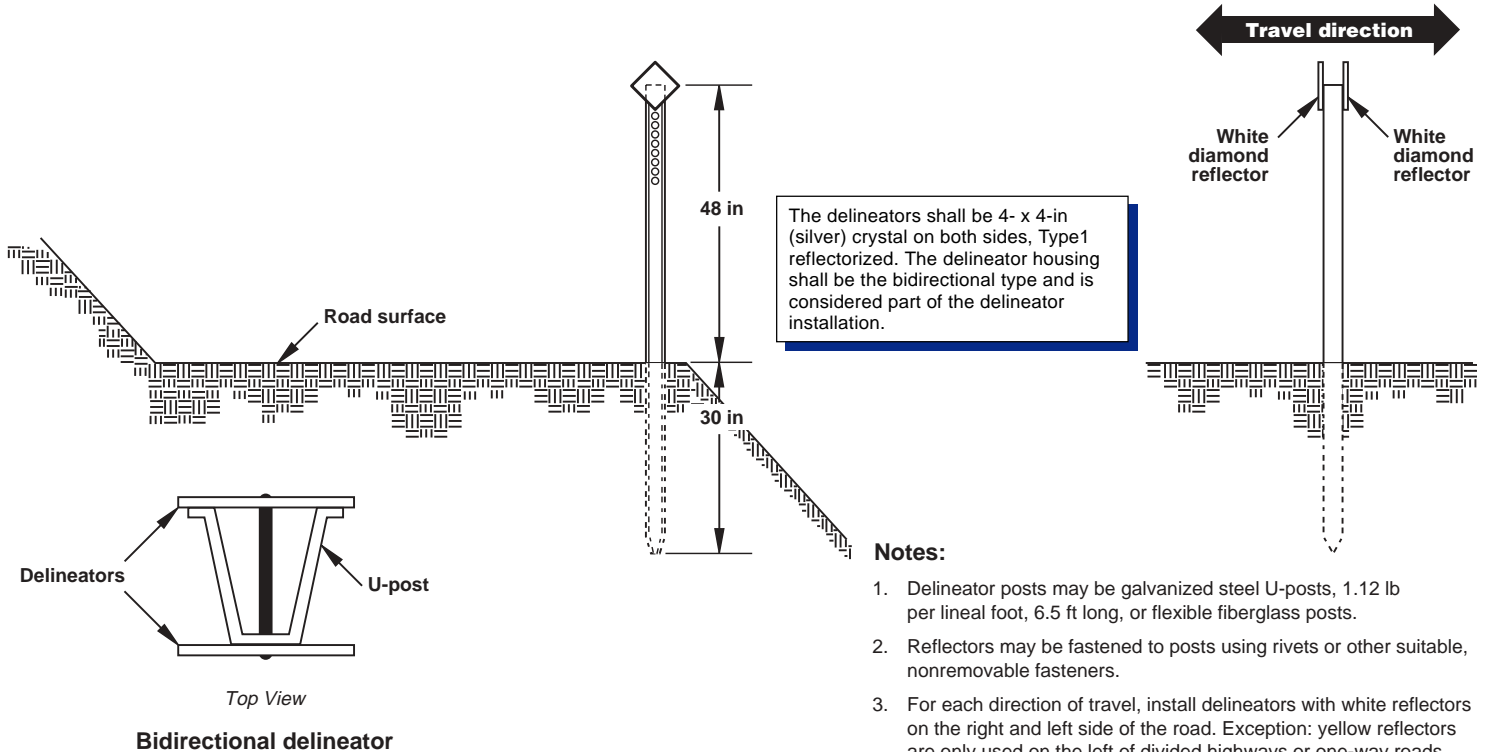
* For higher speeds, refer to MUTCD.

** nsm = no suggested minimum. At these speeds, sign location depends on physical conditions at the site.

The table shows the minimum distances a warning sign should be placed in advance of a condition. The minimum distance is the stopping distance after the sign can be read.

Sign placement distances are based on legibility provided by 24-in signs. If 30- or 36-in signs are used, decrease the placement distances by 50 ft. If 48-in signs are used, decrease the placement distances by 125 ft.

Delineator Details



Orientation Angle



Traffic direction



93°



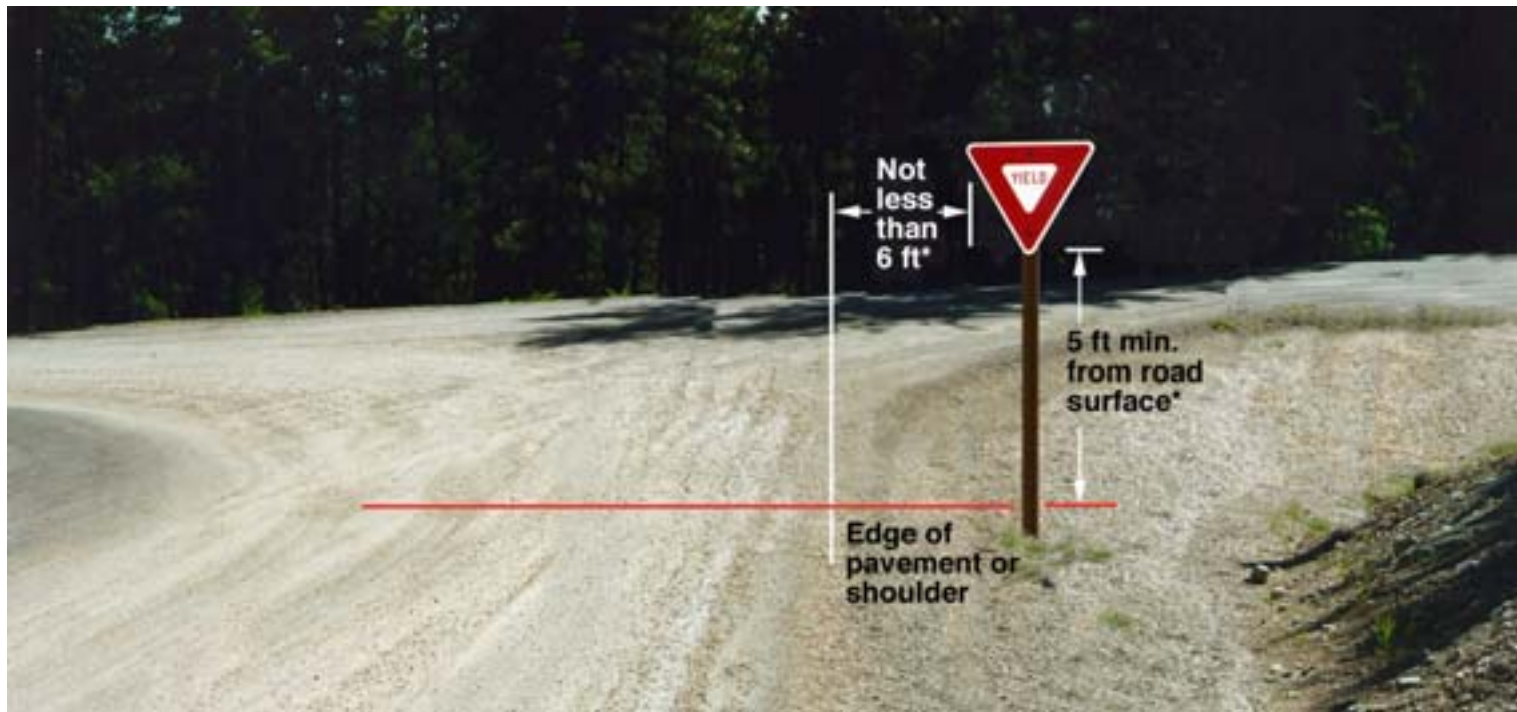
Traffic direction



93°



Signs for motorized traffic control are mounted at approximately right angles to oncoming traffic. It may be necessary to rotate a reflectorized sign slightly off 90 degrees to avoid specular glare reflection off the sign face directly back into the driver's eyes. An angle of about 93 degrees to the line of approaching traffic is recommended by the Federal Highway Administration. On curved alignments, the angle should be determined by the course of approaching traffic and from the point at which the sign is to be read. On grades, it may be necessary to tilt a sign forward or back from vertical to improve the viewing angle.



Regulatory Sign



R1-1

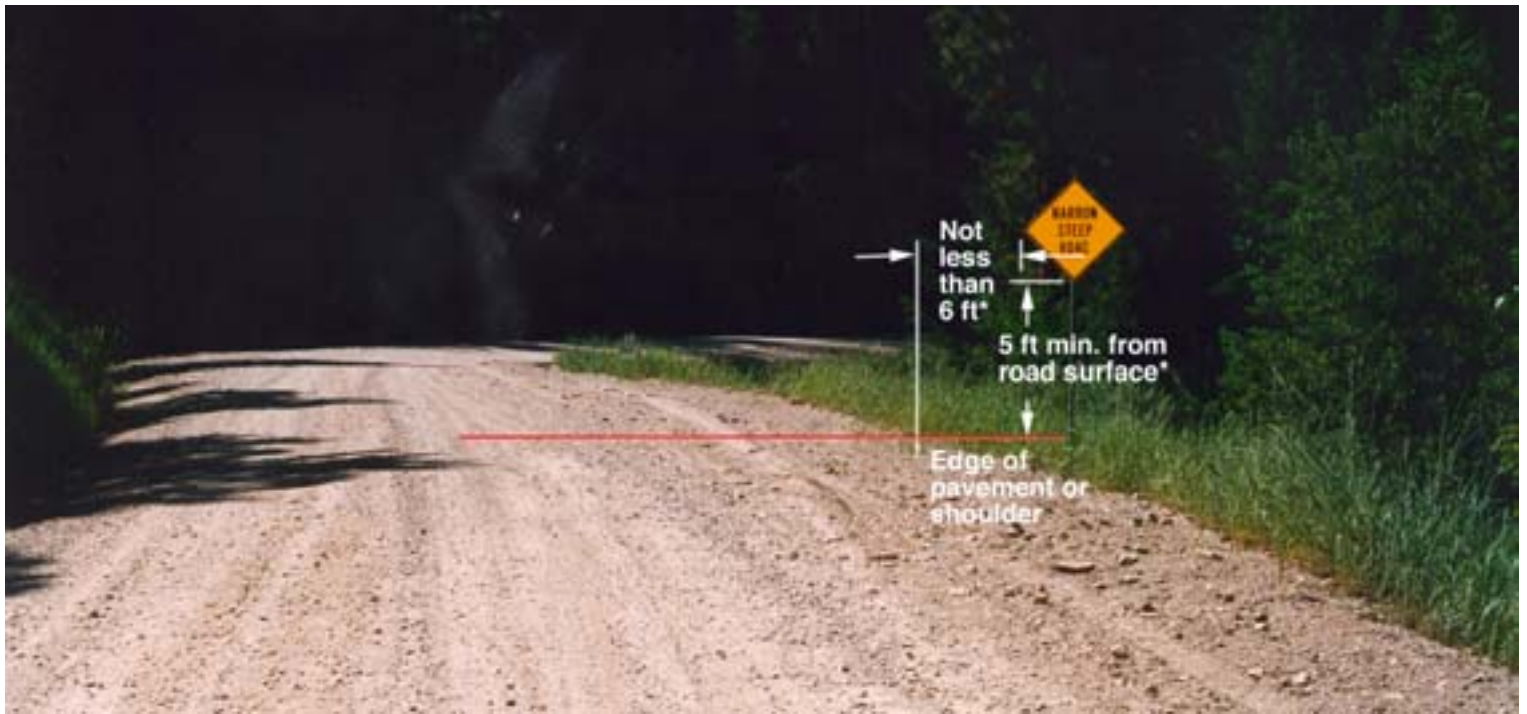


R2-1



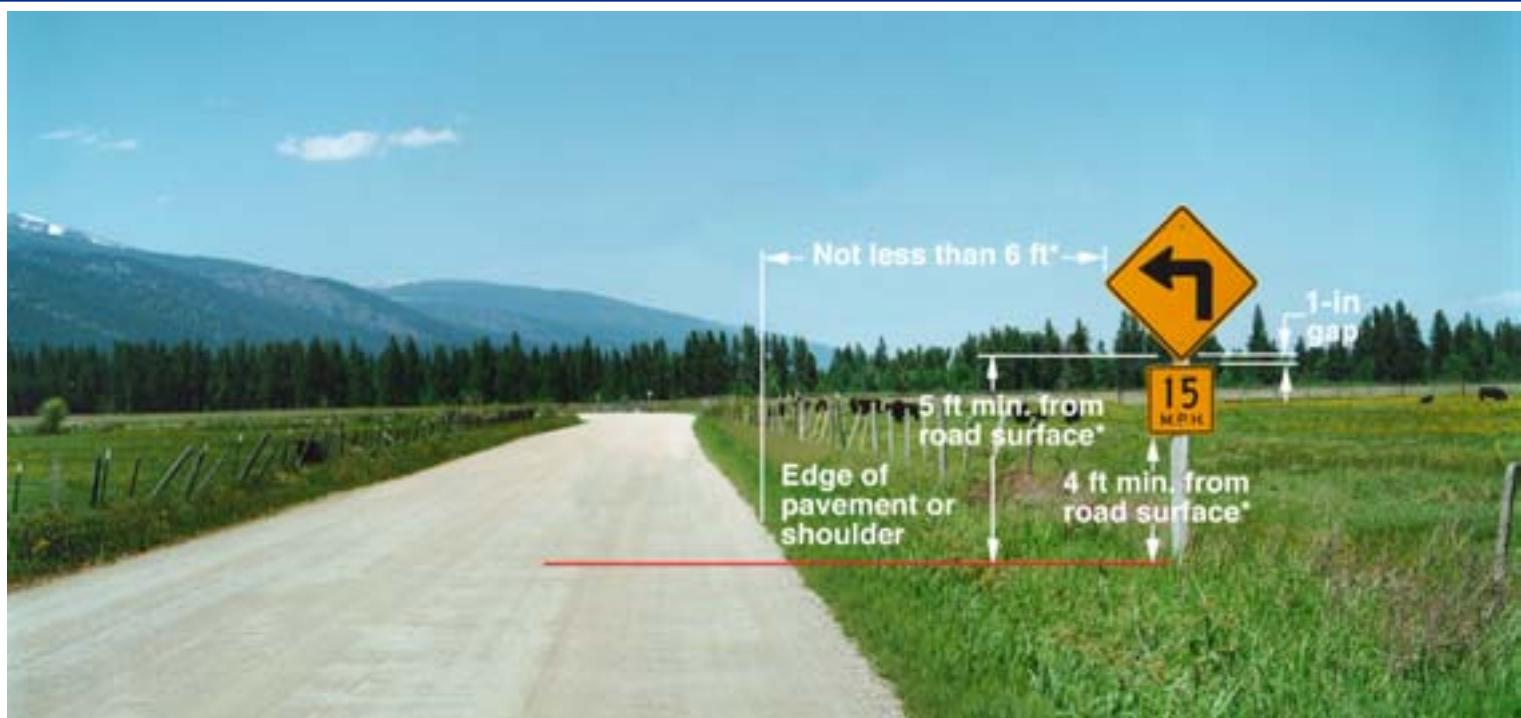
R12-1

* See page iii for placement exceptions.



Warning Sign (no supplemental plaques)

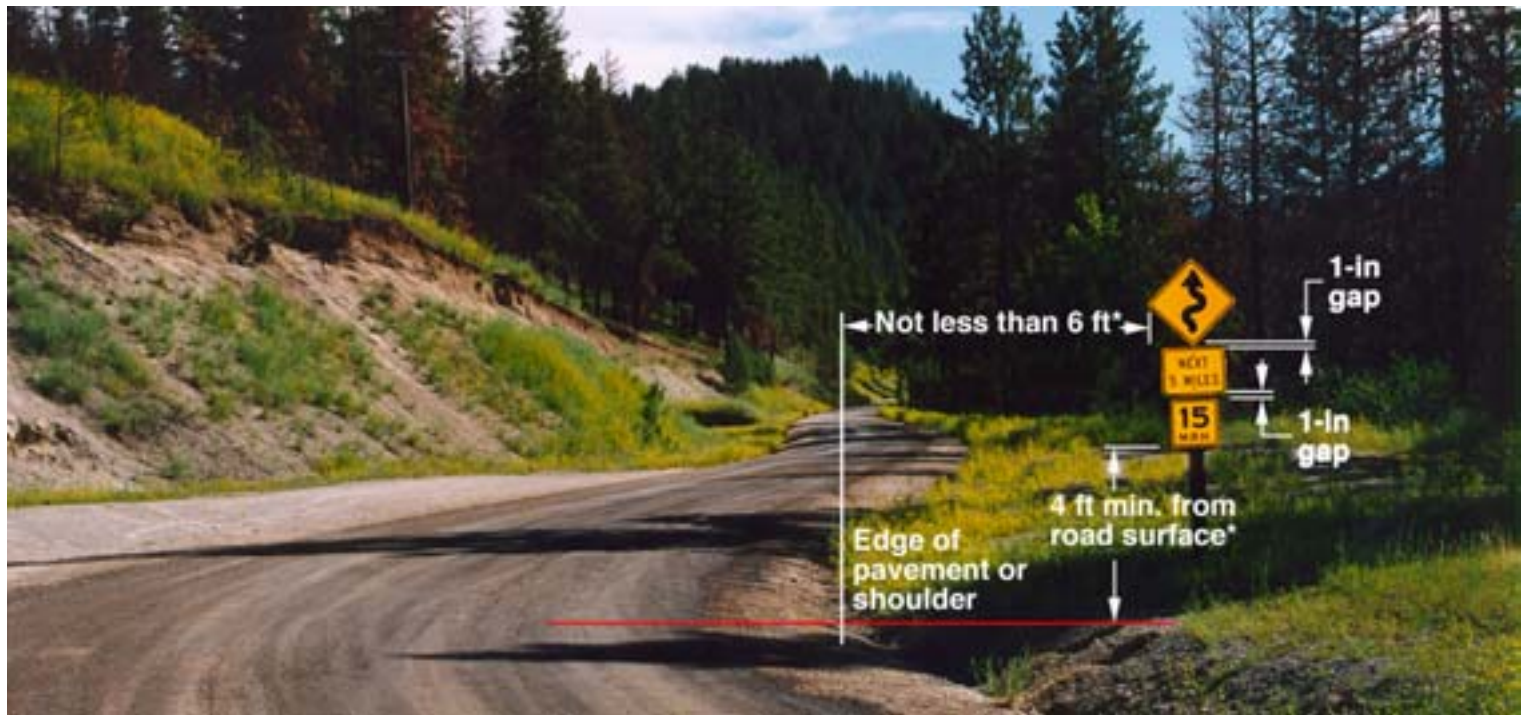
* See page iii for placement exceptions.



Warning Sign With Advisory Speed Plate

Advisory speed plates supplement the warning sign and shall not be used alone.

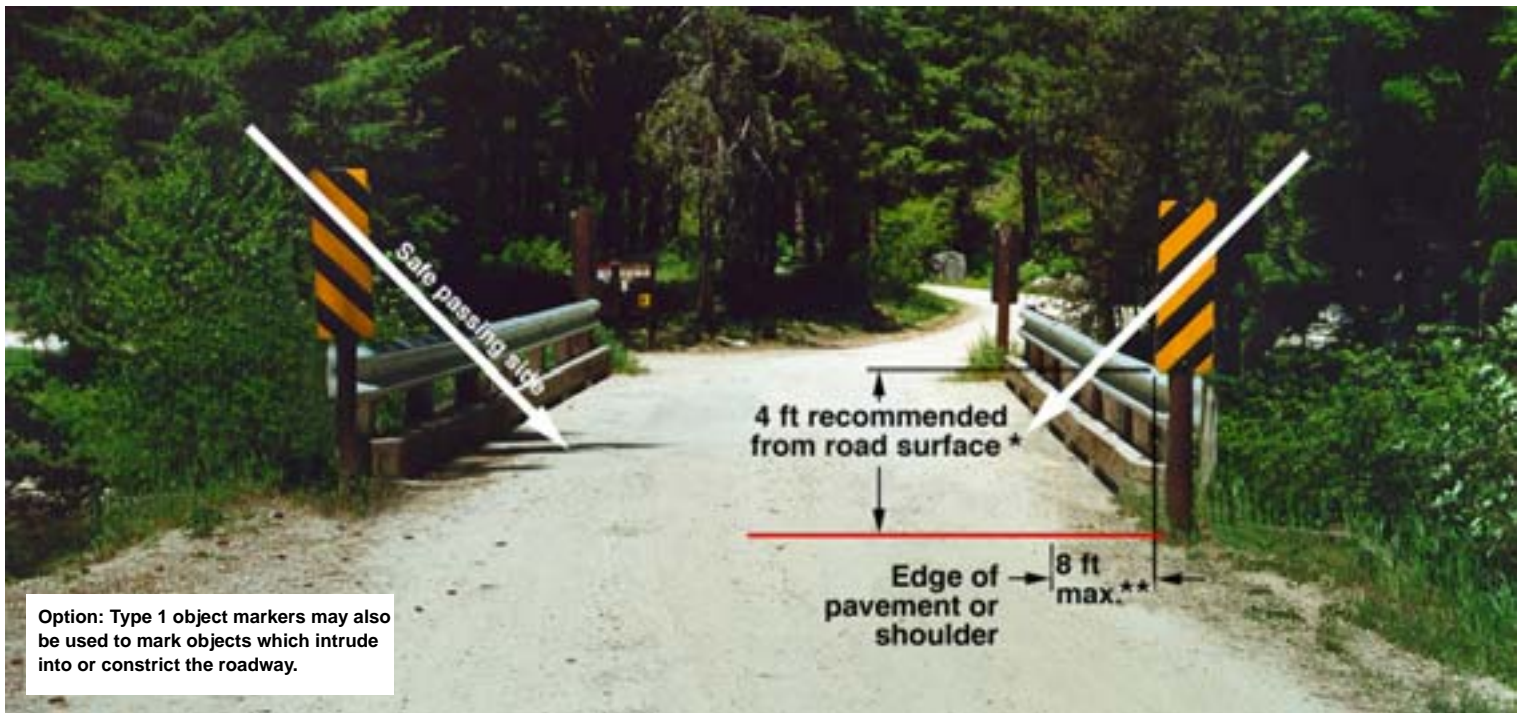
* See page iii for placement exceptions.



Warning Sign With Advisory Speed Plate and Supplemental Plaque

Advisory speed plates and supplemental plaques are not to be used alone.

* See page iii for placement exceptions.



Option: Type 1 object markers may also be used to mark objects which intrude into or constrict the roadway.

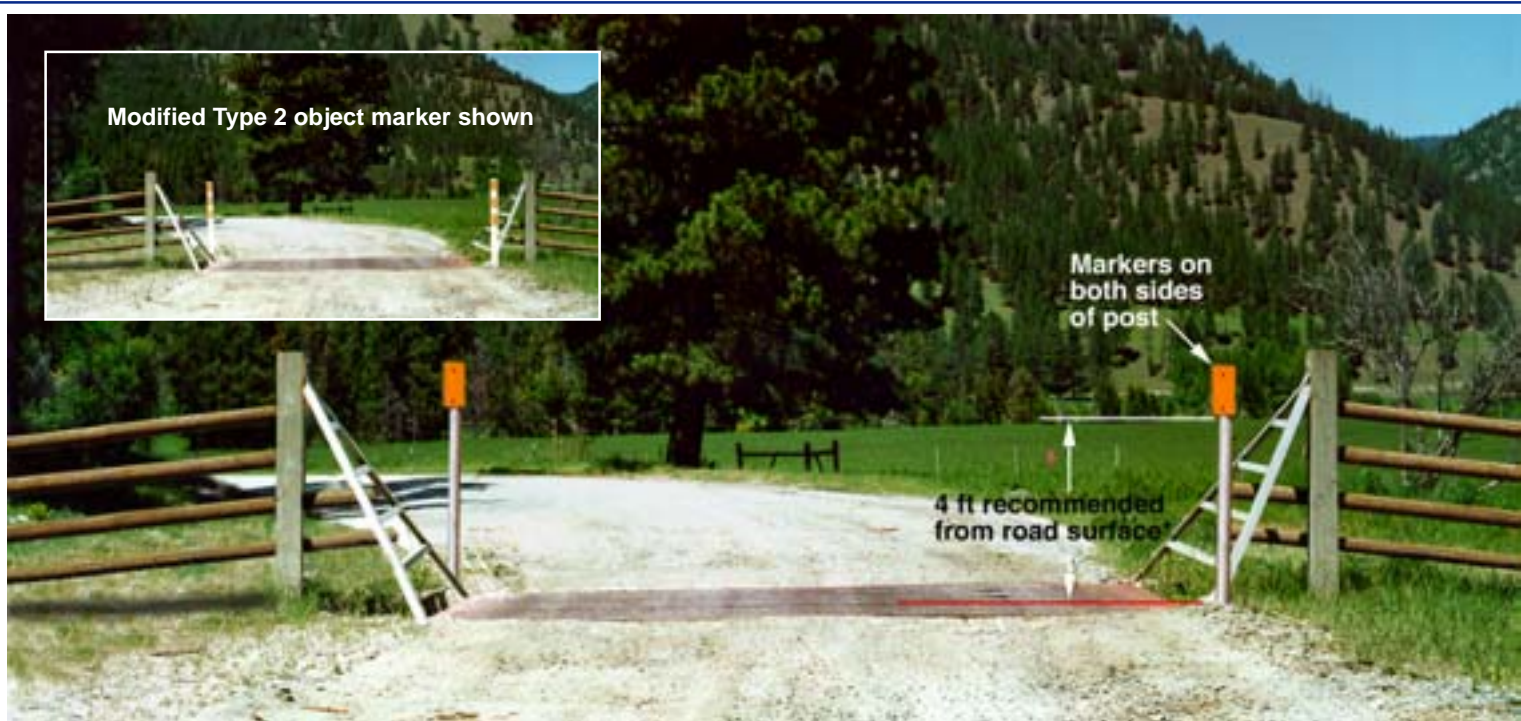
Type 3 Object Marker

(to mark objects which intrude into or constrict the roadway)

*Vertical mounting height may vary according to need when an object requires a lower or higher mounting. **Not** less than 6 inches.

**Do not use Type 3 object marker farther than 8 feet from edge of traveled way or shoulder.

Inside edge of object marker lines up with inside edge of curb or guardrail.



Typical Cattleguard Signing With Modified Type 2 Object Markers (roadway is not constricted)

*Vertical mounting height may vary according to need when an object requires a lower or higher mounting. **Not** less than 6 in.

Type 2 object markers are used to mark objects that are out-side the traveled way but close enough to present a hazard.

Inside edge of object marker lines up with inside edge of obstruction.



Typical Gate Signing With Object Markers (OM) for One-Lane Roads

If motorized or nonmotorized use (such as bicycles) occurs behind a gate, the back side will require signing also. Size of barricade markers depends on approach speeds. Travel management signing: if road use is restricted with

an order, a travel management sign should be mounted on the gate or on a post next to the gate. For seasonal restrictions, it is recommended that the travel management sign be mounted on a post next to the gate so it is visible when the gate is open.



Work Zone Identification Sign

Includes construction, maintenance, and logging operations.

* See page iii for placement exceptions.

All temporary traffic control devices shall be removed as soon as practical when they are no longer needed. When work is suspended for short periods of time, temporary traffic control devices that are no longer appropriate shall be removed or covered.



Do not mount on trees or other signs.

For short term, short-duration, and mobile conditions only. Signs to be constantly maintained for cleanliness, visibility, and correct positioning as they are moved frequently.

Work Zone Sign (temporary support)

Do not locate on sidewalks, bicycle lanes, or areas designated for pedestrian or bicycle traffic.

Signs mounted on portable supports may be placed within the roadway if necessary. Signs may be mounted on or above barricades.

No Turn



Left Turn



Right Turn



Left/Right Turn



Road Closed Sign

This sign is used to mark roads that have been closed to all motorized and nonmotorized traffic (except authorized vehicles) because of a temporary emergency, construction and maintenance activities, or spring breakup. It is not to be used on a gate or closure for seasonal or long-term road restrictions.

When no turns are intended, stripes should be positioned to slope downward toward the center of the barricade. Barricade stripes should slope downward toward direction which road users must turn.



Guide Sign

* See page iii for placement exceptions.



Guide Sign With Route Markers

A 1-inch gap is allowable between multiple (stacked) signs to allow for expansion/contraction.

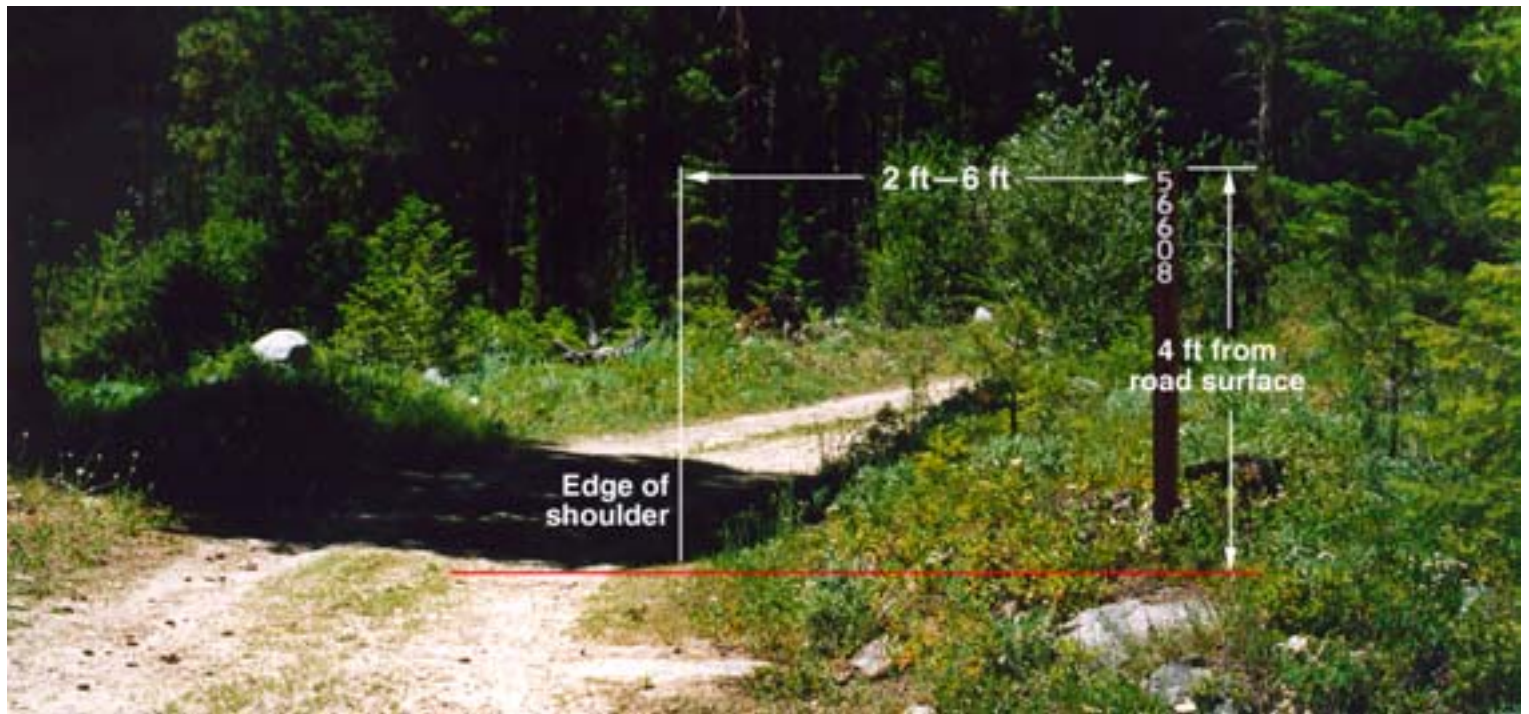
* See page iii for placement exceptions.



Horizontal or Distinctive Route Marker

On steep slope installations, minimum 2 ft distance is preferred to minimize pole height. Install 50 ft to 100 ft from road junction.

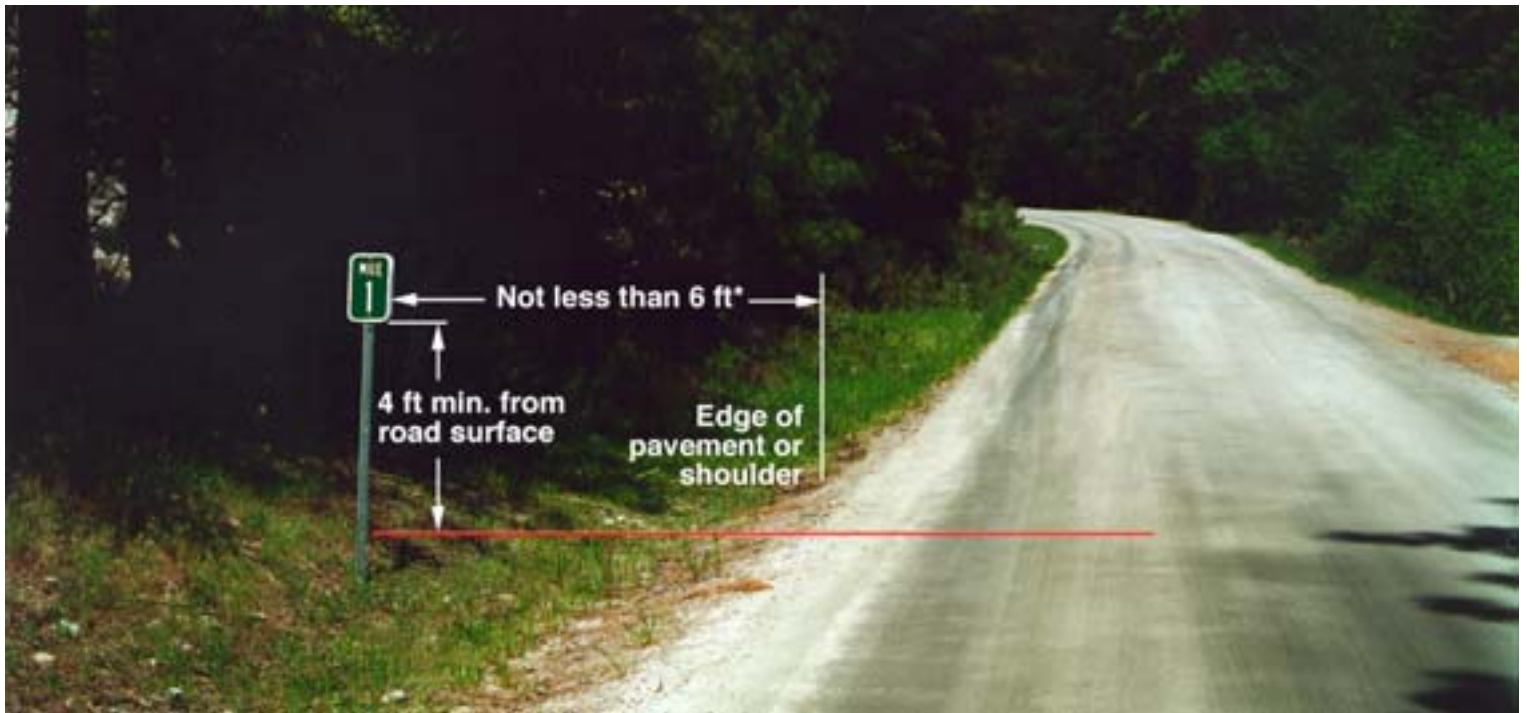
* See page iii for placement exceptions.



Option: Use delineator post and mount wood or aluminum sign panel.

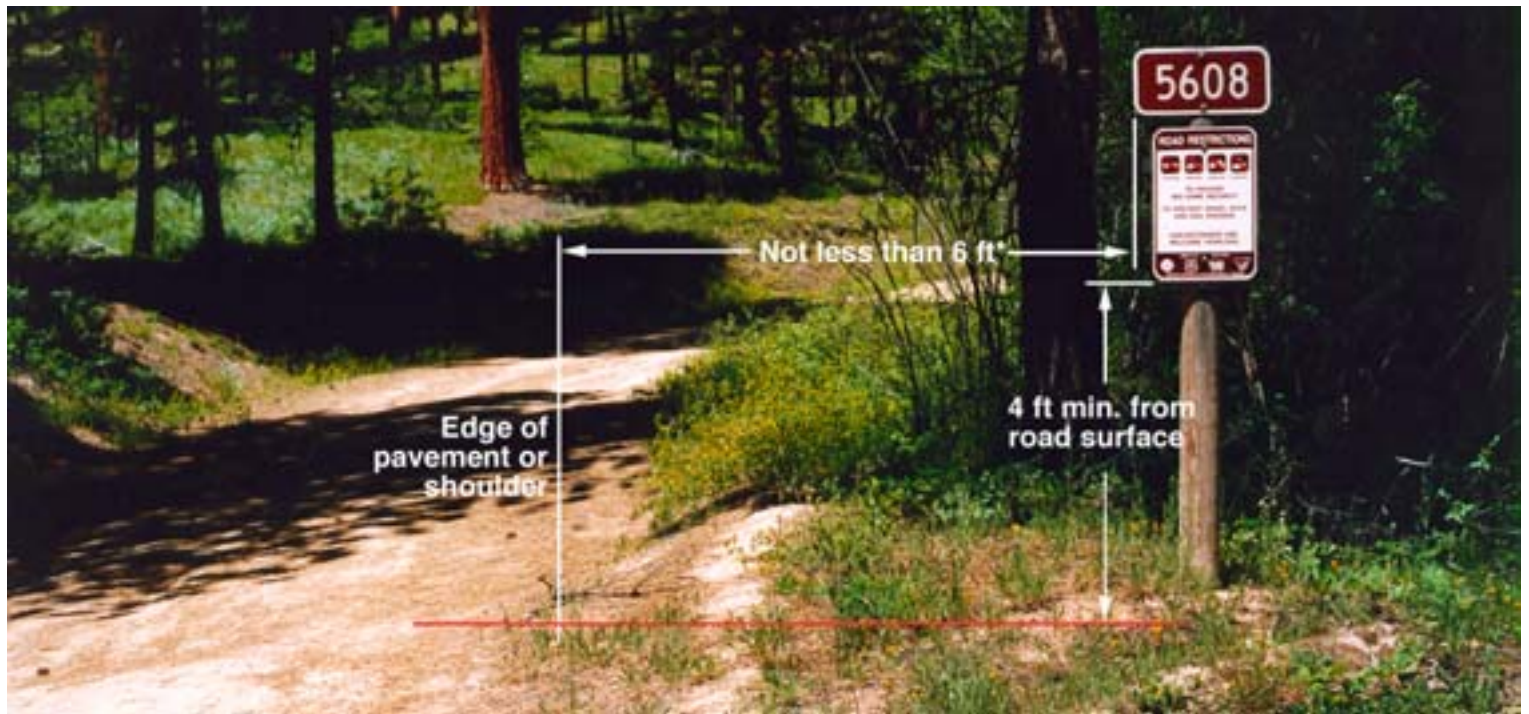


Vertical Route Marker (for maintenance levels 1 and 2 roads)



Milepost Marker

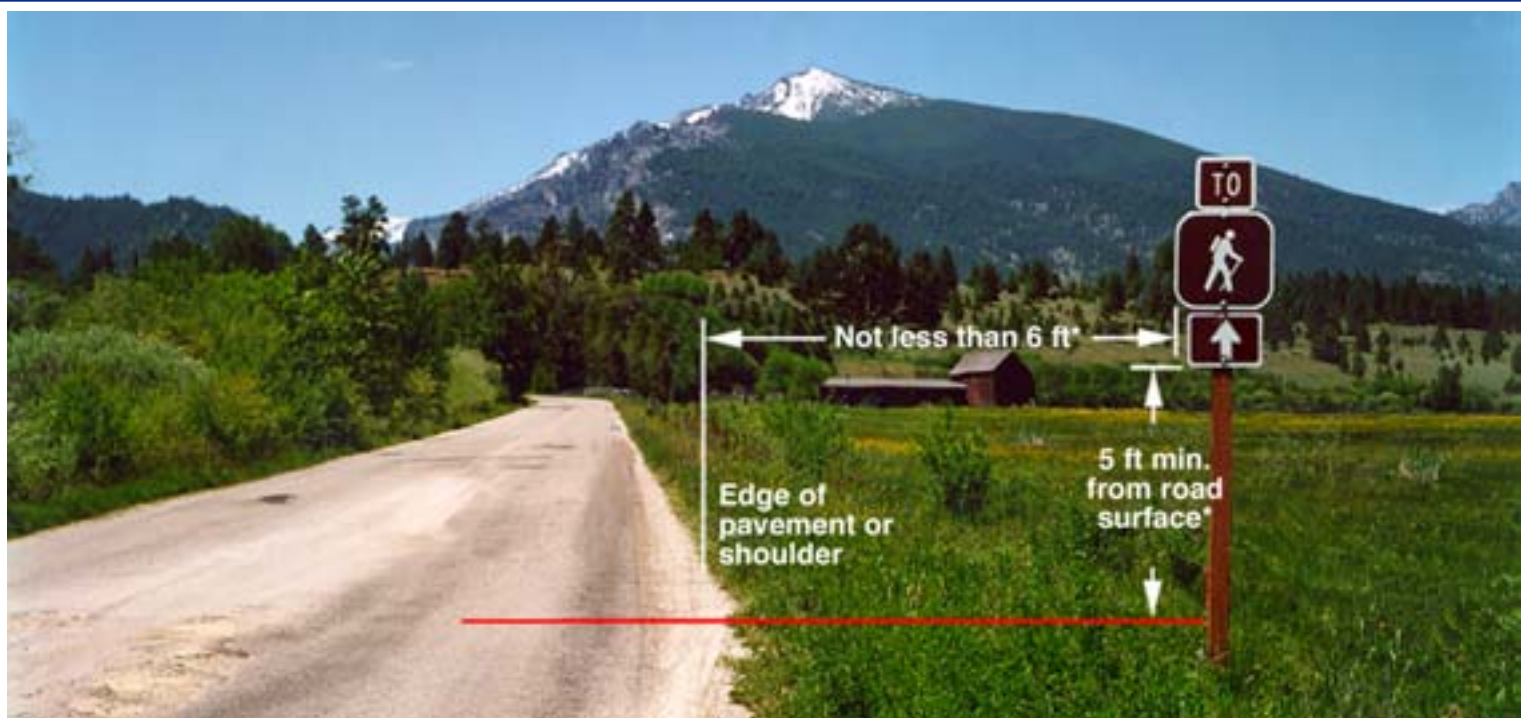
* See page iii for placement exceptions.



Travel Management Sign With Route Marker

If restrictions are noted on travel management sign, there must be an order written under 36 CFR 261.

* See page iii for placement exceptions.



Trailblazer Assembly

A 1-inch gap is allowable between multiple (stacked) signs to allow for expansion/contraction. Background colors on each assembly should be the same.

* See page iii for placement exceptions.



Federal Recreation Symbol Assembly

A 1-inch gap is allowable between multiple (stacked) signs to allow for expansion/contraction. Generally, no more than four symbols on a single sign assembly.

* See page iii for placement exceptions.