



## Correct Sign Installation Improves Safety

Signs are a low cost safety improvement to reduce run off the road crashes. Install signs in safe location so they do not become a roadside hazard.

The Manual on Uniform Traffic Control Devices (MUTCD) describes where to place signs. A new version of the MUTCD is expected at the end of 2008 (<http://mutcd.fhwa.dot.gov>).

According to a General Motors study, 85% of run off the road incidents recover safely within 30 feet of the roadway, in the clear zone.

Although not always possible, a 30-foot clear zone is a worthy goal. The fewer hazards in clear zone, the safer motorists will be.

The following list illustrates methods to create a clear zone and improve roadside safety:

1. Remove the obstacle.
2. Redesign the obstacle for safe traversal.
3. Relocate the obstacle.
4. Make the obstacle breakaway.
5. Shield the obstacle.
6. Delineate the obstacle.



### Sign Hazards

According to the MUTCD, "Sign posts and their foundations and sign mounting, shall be so constructed as to hold signs in proper and permanent position, to resist swaying in the wind or displacement by vandalism. In areas where ground mounted sign supports cannot be sufficiently offset from the pavement edge, sign supports should be of suitable breakaway or yielding design."

### Sign Placement

When possible, place signs where they are not likely to be struck by out-of-control vehicles. Consider the following when installing signs:

- Place signs outside the clear zone.
- Avoid placing signs on curbs.
- Avoid installing signs on the outside of horizontal curves.
- Avoid placing signs next to lane drops or places where the pavement narrows.
- Provide an unobstructed view of signs along the roadway.
- If possible, place signs behind guardrails or other barriers.
- Avoid placing signs in the bottom of the ditches.
- Space signs so they don't obstruct the view of each other. (Recommended spacing is 150 to 200 feet apart. Do not cluster signs together.)

## Sign Posts

A sign post must be durable and structurally adequate. Posts should fail in a safe and predictable manner if struck by a vehicle.

Sign post construction and foundations are critical. Use safe sign supports.

Posts must be able to hold a sign in the proper position and withstand normal wind yet safely yielding when struck by a vehicle.

Use two or more sign posts when signs are large (over 50 square feet).

## Sign Installation Tips

- Bury posts in firm ground 3.5 to 4.0 feet deep.
- Loose or sandy soil may require deeper post placement.
- Use breakaway sign supports to enhance roadside safety.
- Bolt sign panels to the post with oversized washers.
- Use sign connections that prevent vandalism.

## Sign Height

The MUTCD states, "signs erected at the side of the road in rural districts shall be mounted at a height of at least five feet, measured from the bottom of the sign to the near edge of the pavement."

Where there is parking and/or pedestrian movement or where obstructions are present, the clearance to the bottom of the sign must be at least seven feet. The height at the bottom of a sign, mounted below another sign, may be one foot less than the appropriate height specified above.

## Lateral Clearance

Signs should be at least six feet from the shoulder. When there is no shoulder, 12 feet away from the edge of the roadway. In urban areas, a minimum of two feet is recommended, a clearance of one foot from the curb face is permissible where the sidewalk width is limited or where existing poles are close to the curb.

## Sign Panels

Bolt sign panels to the post using oversized washers. Oversized washers:

- Prevent the panel and post from separating on impact.
- Prevent the sign from breaking loose from the post when hit by a vehicle.
- Prevent the bolt from pulling through the sign panel from wind vibrations.

Set the bottom of the sign panel a minimum of seven feet above the pavement or ground. Do not confuse this with the mounting height of five feet above the roadway surface. The new MUTCD will require a seven-foot mounting height. A seven foot mounting height reduces the possibility that the sign and the post might hit the car's windshield.

## U-Channel Steel Posts

The U-channel rolled steel post is the most commonly used small sign support. It is considered breakaway as it will bend or break away at the post/base connection at the ground line when it is hit.

**Maximum Post Sizes for U-Channel Steel Posts**

Maximum Size Panel	Post Size
18" x 24"	2 lb./ft.
30" x 30"	3 lb./ft.
36" x 36"	2 @ 2 lb./ft.

Purchase posts to breakaway on impact and at ground level.

The U-channel steel post manufacturer must certify that posts and hardware have the same chemistry, mechanical properties, and geometry used in the FHWA tests and will meet the FHWA change in velocity requirements.

All U-channel steel posts must be galvanized according to ASTM A-123. The connecting bolts can be cadmium plated according to ASTM A-165 or zinc plated according to ASTM B-633.

Drive the post base into the ground. Do not encase in concrete. The posts base is 3.5 feet in length.

When installation is completed, no more than four inches of the base should be above the ground.

Refer to the manufacturer's wind-load charts for determining post size for other sign panel sizes.

### Splicing U-Channel Steel Posts

To splice U-Channel steel posts, follow these steps:

- Drive a 3.5 foot base post to within approximately 12 inches above ground level.
- Place one bolt and cut washer in the fifth hole from the end and tighten the threaded space securely onto the bolt.
- Drive the base post to four inches above ground level.
- Place the remaining bolt and cut washer in the first hole from the end and tighten the threaded spacer securely onto the bolt.
- Dig out approximately two inches from around the back of the base post to allow room for a sign post to be attached.
- Nest the sign post over the protruding base post bolts through the first and fifth holes of the top post.
- Place a lock washer and lock nut on each bolt.
- Tighten the nuts and tamp the earth around the base post firmly.

Source:

"Correct sign installation can increase motorist safety on local roadway", *Oklahoma LTAP News*, Jan 2005, p.. 3-6

*Geometric Design of Highways and Streets*, AASHTO, 2004, p. 294-5

*Traffic Control Devices Handbook*, ITE, Washington DC, 2001 p. 60, 65

Reference: *University of New Hampshire (UNH) Technology Transfer Center Technical Note # 10*

