



# Roadway Traffic Signs

An Online Continuing Education Course for Engineers

**Course Number: T-3020**

**Credit: 3 Hours / 3 PDH / 3 CPD**

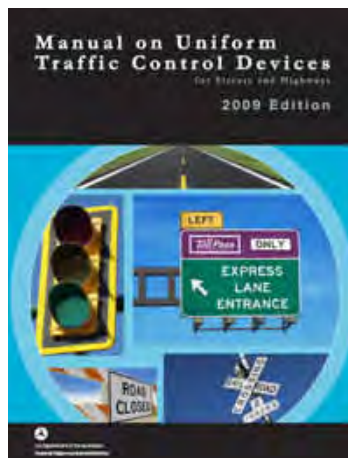
# Roadway Traffic Signs

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## Introduction

This course discusses how to effectively use signs to guide roadway traffic, and thereby reduce your liability exposure. The contents of this course are intended to serve as guidance and not as an absolute standard or rule. Its purpose is to help you to use the **Manual on Uniform Traffic Control Devices (MUTCD) – Part 2** more effectively and not replace it. Should there be any discrepancies between the contents of this course and the MUTCD - always follow the MUTCD. Upon course completion, you should be familiar with the general design guidelines for traffic signs. The course objective is to give engineers and designers an in-depth look at the principles to be considered when selecting and designing for traffic control.

For this course, the *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) 2009 Edition* will serve as a reference for the fundamental design principles of traffic signs. The MUTCD is recognized as the **national standard** for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel. Any traffic control device design or application contained within it is considered to be in the public domain and available for use.



<http://mutcd.fhwa.dot.gov/pdfs/2009/mutcd2009edition.pdf>

Traffic signs are typically used for conveying laws and regulations, traffic and roadway conditions, and guidance and other information. These critical tools provide important information for safe travel on any U.S. roadway system.

Traffic signs are not a cure for all traffic problems. Road users process different types of visual and non-visual information differently: speed, roadway conditions, traffic, legal enforcement, noise levels, etc. Also, traffic signs serve as reminders of important information, so road users do not have to memorize everything.

The goal is to provide drivers with relevant information when they need it - resulting in safer, more efficient roadways with reduced liability risks. However, poor sign management can greatly reduce safety, contribute to roadway incidents, and increase liability exposure.

The *Standard Highway Signs and Markings* book contains detailed specifications for all adopted standard signs. All traffic control devices have to be similar to or mirror images of those shown in this manual. Any symbols or colors cannot be modified unless otherwise stated.



[http://mutcd.fhwa.dot.gov/SHSe/shs\\_2004\\_2012\\_sup.pdf](http://mutcd.fhwa.dot.gov/SHSe/shs_2004_2012_sup.pdf)

## MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

By law (23 CFR 655, Subpart F), the *Manual on Uniform Traffic Control Devices* (MUTCD) is recognized as “the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel”. It is the definitive authority for traffic signs and pavement markings.

Nationwide consistency is the goal of the MUTCD by requiring uniform, understandable, and effective traffic control devices on all facilities open to public travel. It defines the nationwide standards for the installation and maintenance of the devices on all streets and highways. The MUTCD allows us to drive anywhere in the U.S. using the same basic signs with the same meanings. Drivers who see a particular sign should expect it to mean the same thing regardless of location.

**Table I-1. Evolution of the MUTCD**

Year	Name	Month/Year Revised
1927	Manual and Specifications for the Manufacture, Display, and Erection of U.S. Standard Road Markers and Signs (for rural roads)	4/29, 13/31
1930	Manual on Street Traffic Signs, Signals, and Markings (for urban streets)	No revisions
1935	Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)	2/39
1942	Manual on Uniform Traffic Control Devices for Streets and Highways – War Emergency Edition	No revisions
1948	Manual on Uniform Traffic Control Devices for Streets and Highways	9/54
1961	Manual on Uniform Traffic Control Devices for Streets and Highways	No revisions
1971	Manual on Uniform Traffic Control Devices for Streets and Highways	11/71, 4/72, 3/73, 10/73, 6/74, 6/75, 9/76, 12/77
1978	Manual on Uniform Traffic Control Devices for Streets and Highways	12/79, 12/83, 9/84, 3/86
1988	Manual on Uniform Traffic Control Devices for Streets and Highways	1/90, 3/92, 9/93, 11/94, 12/96, 6/98, 1/100
2000	Manual on Uniform Traffic Control Devices for Streets and Highways – Millennium Edition	7/02
2003	Manual on Uniform Traffic Control Devices for Streets and Highways	11/04, 12/07
2009	Manual on Uniform Traffic Control Devices for Streets and Highways	

The Federal Highway Administration (FHWA) publishes the MUTCD which establishes uniform standards for traffic control devices and promotes safety and efficiency on public roads. Road safety can be greatly increased by exceeding MUTCD requirements. Oversized signs may be appropriate for locations where speed, volume or other factors produce conditions that need

additional visibility. Excessive methods should only be employed if a standard measure cannot meet the need. Otherwise, road users may tend to disregard the traffic control device.

The MUTCD has nine chapters (“Parts”):

- General
- Signs
- Marking
- Highway Traffic Signals
- Traffic Control Devices for Low-Volume Roads
- Temporary Traffic Control
- Traffic Control for School Areas
- Traffic Control for Highway-Rail Grade Crossings
- Traffic Control for Bicycle Facilities

Since this course concentrates primarily on the subject of traffic signs, we will focus mainly on **Part 2 - Signs**.

### **SHALL, SHOULD, and MAY**

The terms “shall,” “should,” and “may” have specific meanings when used in the MUTCD.

**SHALL** – Required, mandatory or specifically prohibitive practice.

Any statements with “shall” conditions are typically used as a **STANDARD** in the MUTCD. These items cannot be modified or compromised. There is no allowance for discretion and they must be followed.

**SHOULD** – Advisory or recommended practice in typical situations.

Deviation is appropriate if justified by engineering judgment or study. Statements marked as “should” are used for **GUIDANCE** in the MUTCD.

**MAY** – Permissive or optional practice without requirement or recommendation.

Items marked as “may” are typically used in **OPTION** statements in the MUTCD and can contain allowable modifications.

**SUPPORT** statements do not contain the verbs “shall”, “should”, or “may”. These statements are for informational purposes only (without any mandate, recommendation, or enforcement).

## **Road User**

The MUTCD defines a road user as *“a vehicle operator, bicyclist, or pedestrian, including persons with disabilities, within the highway or on a private road open to public travel”*. This group includes users of various skill levels and ages, pedestrians, wheelchairs, runners, rollerbladers, bicyclists, truck drivers, and motorcyclists. By meeting user needs, engineers can minimize any problems that the average road user may encounter.

## **FIVE BASIC REQUIREMENTS OF TRAFFIC CONTROL DEVICES**

In order to be effective, any traffic control device has to be used in the right way. The MUTCD lists the following principles to be used when selecting and applying each device:

### **1 - Fulfill a need**

A sign should only be installed if there is a need for warning, regulation or guide information. It is also vital to use signs that fulfill that need. If a need exists and the sign in question does not meet that need, use something else. Overusing signs can lead to disrespect and loss of emphasis value while underuse can result in persistent but correctable safety problems.

### **2 - Command attention**

Standard signs are designed to be noticed and catch the attention of road users. The high-contrast color combinations were chosen due to their ability to stand out and be easy to read. Oversized signs, doubled signs, or flashing beacons can also be used to emphasize the sign's message.

Sign maintenance is the key to remain eye-catching. All signs need to be kept in good working order. They need to reflect light at night, and not be faded, cracked, or peeling. Signs in bad condition (dull, battered, vandalized, etc.) are unable to command attention, day or night.

### **3 - Command respect**

Road users are expected to willingly obey warnings and regulations that obviously fulfill a need. Warning and regulatory signs that seem unneeded or unreasonable are regularly disobeyed. Good sign management and maintenance is crucial to commanding respect for traffic control devices. Amateurish, homemade or damaged signs are more likely to be disregarded.

### **4 - Have one simple message**

A sign needs to communicate its message in a way that is clear and readable. By using standard signs in the MUTCD that have been researched and evaluated by the FHWA, most drivers should understand their meanings.

## 5 - Provide adequate time for proper response

Traffic control devices should meet or exceed MUTCD standards so drivers have adequate time (Perception-Response Time – PRT) to react. Drivers need to have the time and distance to take the appropriate action before they reach a situation. If not, insufficient response time may result in roadway crashes.

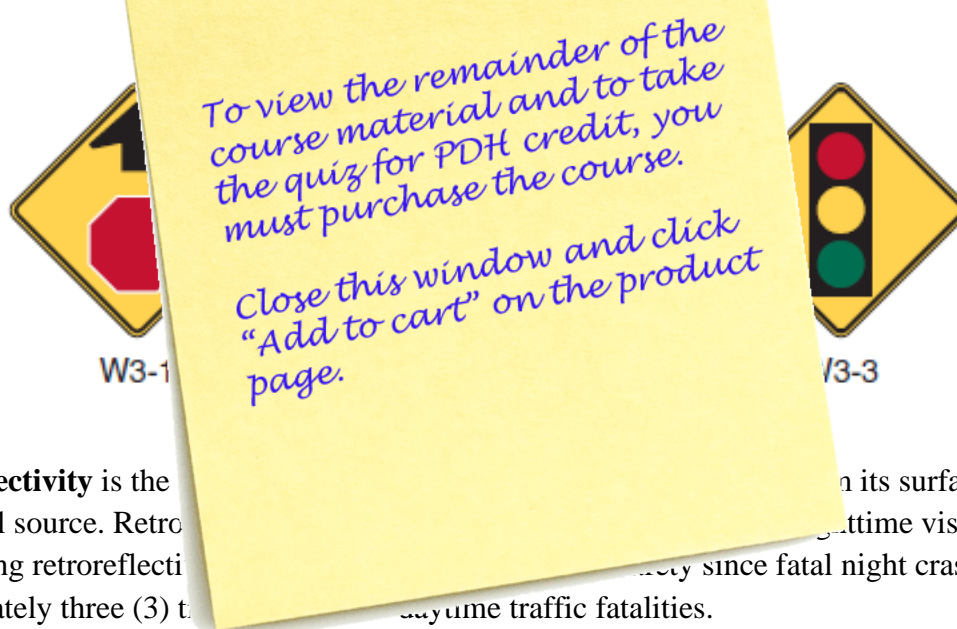
Traffic speed is an important factor for determining driver response time. Vehicles operating at high speeds need longer response time and more distance to react. This increased distance can be obtained by using larger signs, or by placing signs in advance of the location where the information is needed.

Using the five basic requirements will help make your traffic control devices more effective. Design, placement, operation, maintenance, and uniformity should be taken into consideration to maximize the ability of a device to meet these principles. However, by disregarding the five requirements, you may find that road users disregard your traffic control devices.

## SIGNS

### Retroreflectivity

Drivers must be able to read a sign from a reasonable distance and have adequate reaction time to safely travel the roadway. As the national population gets older, the average driver gets older, and people continue driving at older ages. Improving the visibility of signs and pavement markings becomes more important. As we age, our eyes gradually become less sensitive to light.



**Retroreflectivity** is the ability of a sign to reflect light back to its original source. Retroreflectivity is important for nighttime visibility. Maintaining retroreflectivity is important for safety since fatal night crashes occur approximately three (3) times as often as daytime traffic fatalities.