



Roadway Traffic Control II

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PDH: 3

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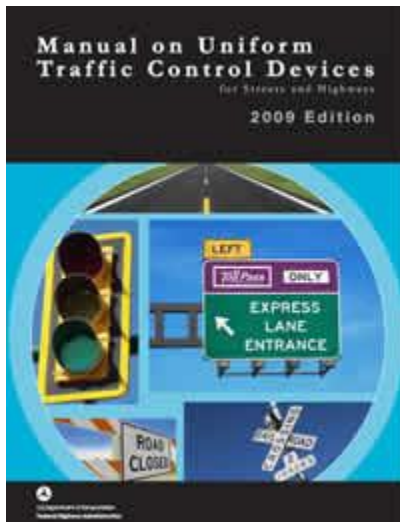


INTRODUCTION

This course is the second of two in this series that discusses how to use the *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) Parts 4 through 9* to establish roadway traffic control. The contents of this course are intended to serve as guidance and not as an absolute standard or rule. It is intended to help you to use the MUTCD more effectively and not replace it. Should there be any conflicts between the contents of this course and the MUTCD, always follow the MUTCD.

Upon course completion, you should be familiar with the general MUTCD guidelines for traffic control devices. The overall 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 the text for the fundamental design principles of traffic signs and pavement markings. This document 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 the MUTCD is considered to be in the public domain and available for use.



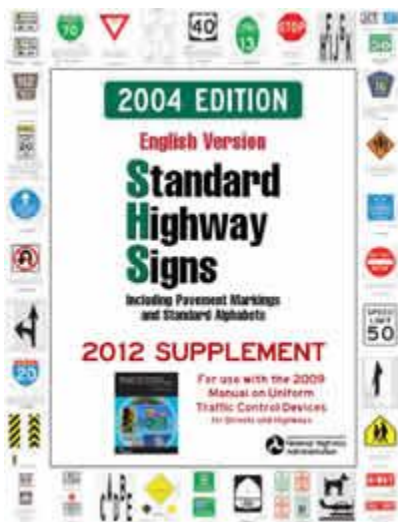
<http://mutcd.fhwa.dot.gov/pdfs/2009/mutcd2009edition.pdf>

Traffic signs and pavement markings are the primary communication devices used to convey laws and regulations, traffic and roadway conditions, and guidance and other information. These critical tools can provide important information to help users to travel safely on any U.S. roadway system.

However, traffic control devices cannot solve all traffic problems. Drivers process different types of visual and non-visual information differently: speed, roadway conditions, traffic, legal enforcement, noise levels, etc. Also, signs and markings 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. On the other hand, poor sign management and maintenance 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 and pavement markings. All traffic control devices shall 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



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.

The MUTCD is published by the Federal Highway Administration (FHWA) to promote safety and efficiency on our public roads by establishing uniform standards for traffic control devices. 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. Drivers who see a particular sign should expect it to mean the same thing and be prepared to take the same action regardless of location.

The MUTCD has nine chapters (“Parts”):

- 1 General Information
- 2 Signs
- 3 Markings
- 4 Highway Traffic Signals
- 5 Low-Volume Roads
- 6 Temporary Traffic Control
- 7 School Areas
- 8 Highway-Rail Grade Crossings
- 9 Bicycle Facilities

For this course, we will be focusing on **Parts 4, 5, 6, 7, 8 and 9.**

TRAFFIC SIGNALS

Standards for traffic control signals are critical for attracting the attention of different types of road users - older, visually impaired, fatigued, distracted, or unexpected. Signals are extremely valuable for controlling traffic by assigning right-of-way for various movements, and influencing flow.

Types of Highway Traffic Signals

Traffic control signals	Pedestrian signals	Hybrid beacons
Emergency-vehicle signals	One-lane, two-way	Lane-use control signals
Entrance ramps signals	In-roadway lights	Movable bridges signals
Toll plaza traffic signals	Flashing beacons	



ADVANTAGES OF PROPER TRAFFIC CONTROL SIGNALS

- Orderly movement of traffic.
- Increases traffic-handling capacity of intersections
- Reduces frequency and severity of certain types of crashes
- Continuous or nearly continuous movement of traffic at a definite speed
- Interrupts heavy traffic at intervals to permit other traffic to cross.

Although traffic control signals are often considered the solution to all intersection traffic problems, they can still be ill-designed, ineffectively located, improperly operated, or poorly maintained.

DISADVANTAGES OF IMPROPER/UNJUSTIFIED TRAFFIC CONTROL SIGNALS

- Excessive delays,
- Excessive disobedience of the signal indications,
- Increased use of less adequate routes to avoid traffic control signals
- Increased frequency of collisions

TRAFFIC SIGNAL WARRANTS

In order to determine if a traffic control signal is justified, an engineering study (containing traffic conditions, pedestrian characteristics, and physical characteristics of the location) should be performed. This study needs to analyze the existing operation and safety factors, and the potential for improving these conditions, plus any applicable factors in the following traffic signal warrants:

Warrant 1 - Eight-Hour Vehicular Volume

The Minimum Vehicular Volume (Condition A) is meant for locations with large volumes of intersecting traffic. The Interruption of Continuous Traffic (Condition B) is intended for sites where Condition A is not satisfied and the traffic volume on a major street affects traffic on a minor intersecting street.



Warrant 1 should be treated as a single warrant. If Condition A is satisfied, then Warrant 1 is satisfied. Similarly, if Condition B is satisfied, then Warrant 1 is satisfied. Any further analysis of the combination of Conditions A and B is not needed.

Warrant 2 - Four-Hour Vehicular Volume → For locations where the intersecting traffic volume is the main reason for consideration.

Warrant 3 - Peak Hour → Meant for locations where the minor-street traffic suffers undue delay (a minimum of 1 hour of an average day) when entering or crossing the major street. This warrant is used only for unusual cases: office complexes, manufacturing plants, industrial complexes, or high-occupancy vehicle facilities, etc.

Warrant 4 - Pedestrian Volume → Intended for application where the traffic volume on a major street is so heavy that pedestrians experience excessive delay in crossing the major street.

Warrant 5 - School Crossing → For locations where schoolchildren crossing a major street is the principal reason to consider a traffic control signal.

Warrant 6 - Coordinated Signal System → Meant for locations with progressive traffic movement in a signal system for maintaining proper vehicle platooning. This signal warrant should not be used where the resultant signal spacing is less than 1,000 feet.

Warrant 7 - Crash Experience → For locations where severe and frequent crashes are the main reasons to consider installing a traffic control signal.

Warrant 8 - Roadway Network → Intended for some intersections to encourage concentration and organization of traffic flow in a roadway network.

Warrant 9 - Intersection Near a Grade Crossing → Can be used where none of the conditions described in the other eight traffic signal warrants are met. The proximity to the intersection of a grade crossing on an approach controlled by a STOP or YIELD sign is the principal reason for consideration.

Satisfying a traffic signal warrant/warrants should not in itself require the installation of a signal. Please consult Chapter 4C for further details addressing these warrants.

SIGNAL FEATURES

For road users, the most important features of traffic control signals are location, design, and meaning of the signal indications. Uniform design features are especially important for the safety and efficiency of operations.



Purchase this course to
see the remainder of
the technical materials.