



Work Zone Traffic Control II

Course Number: CE-03-911

PDH: 3

Approved for: AK, AL, AR, DC, DE, FL, GA, IA, ID, IL, IN, KS, KY, LA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NH, NJ, NM, NV, NY, OH, OK, OR, PA, SC, SD, TN, TX, UT, VA, VT, WI, WV, and WY

State Board Approvals

Florida Provider # 0009553 License #868

Indiana Continuing Education Provider #CE21800088

Maryland Approved Provider of Continuing Professional Competency

New Jersey Professional Competency Approval #24GP00025600

North Carolina Approved Sponsor #S-0695

NYSED Sponsor #274

Course Author: Greg Taylor

How Our Written Courses Work

This document is the course text. You may review this material at your leisure before or after you purchase the course.

After the course has been purchased, review the technical material and then complete the quiz at your convenience.

A Certificate of Completion is available once you pass the exam (70% or greater).

If a passing grade is not obtained, you may take the quiz as many times as necessary until a passing grade is obtained).

If you have any questions or technical difficulties, please call (508) 298-4787 or email us at admin@PDH Pro.com.

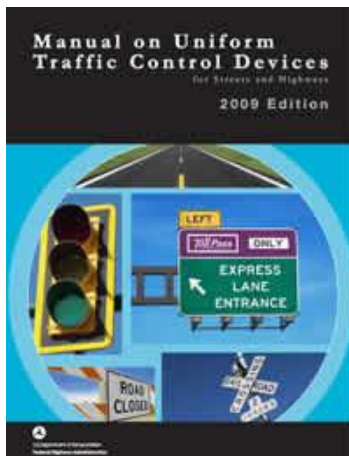


INTRODUCTION

This course is the second of two in this series that shows how to effectively plan and design temporary traffic controls for work zone locations. 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 6 – Temporary Traffic Control** 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 work zone traffic control. The course objective is to give engineers and designers an in-depth look at the principles to be considered when selecting and designing temporary traffic control for work zones.

For this course, the *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) 2009 Edition* will serve as a reference for fundamental design principles. 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> MUTCD 2009

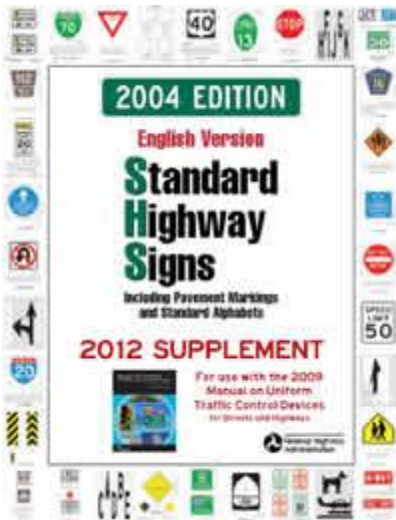
<http://mutcd.fhwa.dot.gov/pdfs/2009/part6.pdf> Part 6

Traffic signs and pavement markings 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.

Road users process different types of visual and non-visual information differently: speed, roadway conditions, traffic, legal enforcement, noise levels, etc. 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. 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 and pavement markings. All traffic control devices have to be similar to or mirror images of those 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.

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.

The MUTCD has nine chapters (“Parts”):

General

Signs

Marking

Highway Traffic Signals

Low-Volume Roads

Temporary Traffic Control

School Areas

Highway-Rail Grade Crossings

Bicycle Facilities

Since this course concentrates primarily on the subject of temporary traffic control, we will focus mainly on **Part 6 - Temporary Traffic Control**.



PAVEMENT MARKINGS

Pavement marking is more than just roadway striping. It is a guidance system that relays regulatory and vehicle-path information to the user without requiring them to divert their attention from the road. These markings should encourage safe, efficient traffic flow while optimizing roadway capacity. In order to be effective, pavement markings need to be easily recognized and understood. A uniform system of marking color, shape, and application has been developed to convey the same message for a specific situation.

All pavement markings need to be properly maintained to assure good daytime and nighttime visibility. It is the municipality's responsibility to maintain the marking once the decision has been made to install it. If the municipality decides that the marking is no longer needed, documentation of the decision process should be recorded. Pavement markings deemed non-applicable or confusing should be removed as soon as possible.

Temporary markings within TTC zones provide a clearly defined path through the work zone. These markings are typically needed during roadway reconstruction while open to traffic (resurfacing, lane shifts, etc.).

MATERIALS

Pavement markings typically include paints and thermoplastics but they may also use other marking materials (colored paving, raised pavement markers, etc.). Highly visible delineators and channelizing devices can also be placed vertically above the roadway.

Paint is the easiest, cheapest, and most commonly used pavement marking material. However, it is also the least durable. To combat poor nighttime visibility, retroreflectivity can be improved by adding glass beads into the wet paint.

Thermoplastic pavement markings use a heated temperature-setting plastic material for use on asphalt pavements. Due to temperature-related expansion and contraction differentials between plastic and concrete (which may result in thermoplastic separation) thermoplastic is prohibited from use on concrete.

Marking color, pattern, and orientation provide crucial information to roadway users. Complying with these standards provide positive guidance and should be maintained throughout the product's life. Materials that minimize tripping or maintain traction for users (pedestrians, bicyclists, motorcycles, etc.) should also be considered when choosing pavement markings.



RAISED PAVEMENT MARKERS (RPM)

Raised pavement markers may be substituted for other types of markings in TTC zones. These are normally used for detours, temporary roadways, and/or new travel lane alignments. The color of raised pavement markers under both daylight and nighttime conditions should match the color of the marking for which they serve, supplement or substitute.

Retroreflective or internally illuminated raised pavement markers can be used in the roadway bordering curbed approach ends or on top of raised medians and curbs of islands. These markers are available in mono-directional and bidirectional types (capable of displaying the applicable color for each direction of travel). Internally illuminated markers must be steadily illuminated and not flash when used.

Non-retroreflective raised pavement markers should not be used as a lone substitute for other types of pavement markings without supplemental retroreflective or internally illuminated markers.

Directional configurations should maximize correct information and minimize confusing information from other markers that do not apply to the road user.

The spacing of RPMs should correspond with the pattern of broken lines for which the markers serve, supplement or substitute. For additional emphasis, retroreflective raised pavement markers may be spaced closer than described in the MUTCD if determined appropriate by engineering judgment/study.

For further information, the *“Traffic Control Devices Handbook”* contains spacing details for raised pavement markers on longitudinal markings.

DELINEATORS

Delineators should supplement or act in combination with other temporary traffic control devices to indicate the roadway’s alignment and to outline the vehicle path through the TTC zone. Delineators are useful for roadway locations with long continuous sections or short stretches where the alignment might be confusing or unexpected (lane-reduction transitions, horizontal curves, etc.). These are effective *guidance* devices (rather than warning devices) at night and during adverse weather due to their visibility when the roadway may be wet or snow covered.



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