

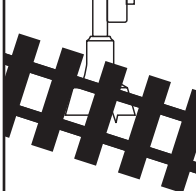
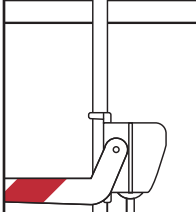


Manual on Uniform Traffic Control Devices

for Streets and Highways

2003 EDITION

Including Revision 1 dated November 2004



SCHOOL



U.S. Department of Transportation
Federal Highway Administration



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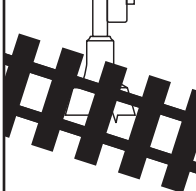
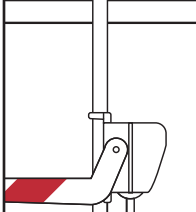


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The Manual on Uniform Traffic Control Devices (MUTCD) is approved by the Federal Highway Administrator as the National Standard in accordance with Title 23 U.S. Code, Sections 109(d), 114(a), 217, 315, and 402(a), 23 CFR 655, and 49 CFR 1.48(b)(8), 1.48(b)(33), and 1.48(c)(2).

Addresses for Publications Referenced in the MUTCD

American Association of State Highway and Transportation Officials (AASHTO)
444 North Capitol Street, NW, Suite 249
Washington, DC 20001
www.transportation.org

American Railway Engineering and Maintenance-of-Way Association (AREMA)
8201 Corporate Drive, Suite 1125
Landover, MD 20785-2230
www.arena.org

Federal Highway Administration Report Center
Facsimile number: 301.577.1421
report.center@fhwa.dot.gov

Illuminating Engineering Society (IES)
120 Wall Street, Floor 17
New York, NY 10005
www.iesna.org

Institute of Makers of Explosives
1120 19th Street, NW, Suite 310
Washington, DC 20036-3605
www.ime.org

Institute of Transportation Engineers (ITE)
1099 14th Street, NW, Suite 300 West
Washington, DC 20005-3438
www.ite.org

International Organization for Standards
c/o Mr. Gerard Kuso
Austrian Standards Institute
Heinestrasse 38
Postfach 130
A-1021
Wien, Austria
www.iso.ch

ISEA - The Safety Equipment Association
1901 North Moore Street, Suite 808
Arlington, VA 22209
www.safetyequipment.org

National Committee on Uniform Traffic Laws and Ordinances (NCUTLO)
107 South West Street, Suite 110
Alexandria, VA 22314
www.ncutlo.org

Occupational Safety and Health Administration (OSHA)
U.S. Department of Labor
200 Constitution Avenue, NW
Washington, DC 20210
www.osha.gov

Transportation Research Board (TRB)
The National Academies
2101 Constitution Avenue, NW
Washington, DC 20418
www.nas.edu/trb

U.S. Architectural and Transportation Barriers Compliance Board (The U.S. Access Board)
1331 F Street, NW, Suite 1000
Washington, DC 20004-1111
www.access-board.gov

Acknowledgments

The Federal Highway Administration gratefully acknowledges the valuable assistance that it received from the National Committee on Uniform Traffic Control Devices and its over 200 voluntary members in the development of this Manual.

MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

INTRODUCTION

Standard:

Traffic control devices shall be defined as all signs, signals, markings, and other devices used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or bikeway by authority of a public agency having jurisdiction.

The Manual on Uniform Traffic Control Devices (MUTCD) is incorporated by reference in 23 Code of Federal Regulations (CFR), Part 655, Subpart F and shall be recognized as the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel in accordance with 23 U.S.C. 109(d) and 402(a). The policies and procedures of the Federal Highway Administration (FHWA) to obtain basic uniformity of traffic control devices shall be as described in 23 CFR 655, Subpart F.

Any traffic control device design or application provision contained in this Manual shall be considered to be in the public domain. Traffic control devices contained in this Manual shall not be protected by a patent, trademark, or copyright, except for the Interstate Shield and any other items owned by FHWA.

Support:

The need for uniform standards was recognized long ago. The American Association of State Highway Officials (AASHO), now known as the American Association of State Highway and Transportation Officials (AASHTO), published a manual for rural highways in 1927, and the National Conference on Street and Highway Safety (NCSHS) published a manual for urban streets in 1930. In the early years, the necessity for unification of the standards applicable to the different classes of road and street systems was obvious. To meet this need, a joint committee of AASHO and NCSHS developed and published the original edition of this Manual on Uniform Traffic Control Devices (MUTCD) in 1935. That committee, now called the National Committee on Uniform Traffic Control Devices (NCUTCD), though changed from time to time in name, organization, and personnel, has been in continuous existence and has contributed to periodic revisions of this Manual. The FHWA has administered the MUTCD since the 1971 edition. The FHWA and its predecessor organizations have participated in the development and publishing of the previous editions. There were eight previous editions of the MUTCD, and several of those editions were revised one or more times. Table I-1 traces the evolution of the MUTCD, including the two manuals developed by AASHO and NCSHS.

Standard:

The U.S. Secretary of Transportation, under authority granted by the Highway Safety Act of 1966, decreed that traffic control devices on all streets and highways open to public travel in accordance with 23 U.S.C. 109(d) and 402(a) in each State shall be in substantial conformance with the Standards issued or endorsed by the FHWA.

Support:

23 CFR 655.603 adopts the MUTCD as the national standard for any street, highway, or bicycle trail open to public travel in accordance with 23 U.S.C. 109(d) and 402(a). The “Uniform Vehicle Code (UVC)” is one of the publications referenced in the MUTCD. The UVC contains a model set of motor vehicle codes and traffic laws for use throughout the United States. The States are encouraged to adopt Section 15-116 of the UVC, which states that, “No person shall install or maintain in any area of private property used by the public any sign, signal, marking, or other device intended to regulate, warn, or guide traffic unless it conforms with the State manual and specifications adopted under Section 15-104.”

The Standard, Guidance, Option, and Support material described in this edition of the MUTCD provide the transportation professional with the information needed to make appropriate decisions regarding the use of traffic control devices on streets and highways. The material in this edition is organized to better differentiate between Standards that must be satisfied for the particular circumstances of a situation, Guidances that should be followed for the particular circumstances of a situation, and Options that may be applicable for the particular circumstances of a situation.

Throughout this Manual the headings Standard, Guidance, Option, and Support are used to classify the nature of the text that follows. Figures, tables, and illustrations supplement the text and might constitute a Standard, Guidance, Option, or Support. The user needs to refer to the appropriate text to classify the nature of the figure, table, or illustration.

Standard:

When used in this Manual, the text headings shall be defined as follows:

1. **Standard**—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All standards are labeled, and the text appears in bold type. The verb shall is typically used. Standards are sometimes modified by Options.

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, 12/31
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, 1/00
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	

2. **Guidance**—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb **should** is typically used. Guidance statements are sometimes modified by Options.
3. **Option**—a statement of practice that is a permissive condition and carries no requirement or recommendation. Options may contain allowable modifications to a Standard or Guidance. All Option statements are labeled, and the text appears in unbold type. The verb **may** is typically used.
4. **Support**—an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition. Support statements are labeled, and the text appears in unbold type. The verbs **shall**, **should**, and **may** are not used in Support statements.

Support:

Throughout this Manual all dimensions and distances are provided in the International System of Units, a modernized version of the Metric system, and their English equivalent units are shown in parentheses.

Guidance:

Before laying out distances or determining sign sizes, the public agency should decide whether to use the International System of Units (Metric) or the English equivalent units. The chosen units should be specified on plan drawings. The chosen unit of measurement should be made known to those responsible for designing, installing, or maintaining traffic control devices.

Except when a specific numeral is required by the text of a Section of this Manual, numerals shown on the sign images in the figures that specify quantities such as times, distances, speed limits, and weights should be regarded as examples only. When installing any of these signs, the numerals should be appropriately altered to fit the specific signing situation.

Support:

The following information will be useful when reference is being made to a specific portion of text in this Manual.

There are ten Parts in this Manual and each Part is comprised of one or more Chapters. Each Chapter is comprised of one or more Sections. Parts are given a numerical identification, such as Part 2-Signs. Chapters are identified by the Part number and a letter, such as Chapter 2B-Regulatory Signs. Sections are identified by the Chapter number and letter followed by a decimal point and a number, such as Section 2B.03-Size of Regulatory Signs.

Each Section is comprised of one or more paragraphs. The paragraphs are indented but are not identified by a number or letter. Paragraphs are counted from the beginning of each Section without regard to the intervening text headings (Standard, Guidance, Option, or Support). Some paragraphs have lettered or numbered items. As an example of how to cite this Manual, the phrase “Not less than 12 m (40 ft) beyond the stop line” that appears on Page 4D-12 of this Manual would be referenced in writing as “Section 4D.15, P7, D1(a),” and would be verbally referenced as “Item D1(a) of Paragraph 7 of Section 4D.15.”

Standard:

In accordance with 23 CFR 655.603(b)(1), States or other Federal agencies that have their own MUTCDs or Supplements shall revise these MUTCDs or Supplements to be in substantial conformance with changes to the National MUTCD within 2 years of issuance of the changes. Unless a particular device is no longer serviceable, non-compliant devices on existing highways and bikeways shall be brought into compliance with the current edition of the National MUTCD as part of the systematic upgrading of substandard traffic control devices (and installation of new required traffic control devices) required pursuant to the Highway Safety Program, 23 U.S.C. § 402(a). In cases involving Federal-aid projects for new highway or bikeway construction or reconstruction, the traffic control devices installed (temporary or permanent) shall be in conformance with the most recent edition of the National MUTCD before that highway is opened or re-opened to the public for unrestricted travel [23 CFR 655.603(d)(2)]. The FHWA has the authority to establish other target compliance dates for implementation of particular changes to the MUTCD [23 CFR 655.603(d)(4)]. These target compliance dates established by the FHWA shall be as follows:

Section 2A.19 Lateral Offset—crashworthiness of sign supports—January 17, 2013 for roads with posted speed limit of 80 km/h (50 mph) or higher.

Section 2B.03 Size of Regulatory Signs—increased sign sizes and other changes to Table 2B-1—10 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 2B.04 STOP Sign (R1-1)—4-WAY plaque requirement—January 17, 2004.

Section 2B.06 STOP Sign Placement—signs mounted on back of STOP sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.

- Section 2B.09 YIELD Sign Applications—changes in YIELD sign application criteria from the 1988 MUTCD—January 17, 2011.**
- Section 2B.10 YIELD Sign Placement—signs mounted on back of YIELD sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.11 Yield Here to Pedestrians Signs (R1-5, R1-5a)—new section—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.13 Speed Limit Sign (R2-1)—color of changeable message legend of YOUR SPEED—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.25 Reversible Lane Control Signs (R3-9d, R3-9f through R3-9i)—removal of R3-9c and R3-9e signs—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.26 Preferential Only Lane Signs (R3-10 through R3-15)—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.27 Preferential Only Lanes for High-Occupancy Vehicles (HOVs)—new section in Millennium Edition—January 17, 2007.**
- Section 2B.28 Preferential Only Lane Sign Applications and Placement—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.37 ONE WAY Signs (R6-1, R6-2)—placement requirement at intersecting alleys—January 17, 2008.**
- Section 2B.46 Photo Enforced Signs (R10-18, R10-19)—new section—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2B.52 Hazardous Material Signs (R14-2, R14-3)—change in sign legend—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.04 Size of Warning Signs—increased sizes of W4-1, W5-2, W6-3, and W12-1 signs—January 17, 2008.**
- Section 2C.04 Size of Warning Signs—sizes of W1 Series Arrows signs, W7 Series truck runaway signs, W12-2p low clearance signs, and W10-1 advance grade crossing sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.11 Truck Rollover Warning Signs (W1-13, W1-13a)—new section—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.16 NARROW BRIDGE Sign (W5-2)—elimination of symbol sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.25 PAVEMENT ENDS Sign (W8-3)—removal of symbol sign—January 17, 2011.**
- Section 2C.26 Shoulder Signs (W8-4, W8-9, and W8-9a)—removal of symbol signs—January 17, 2011.**
- Section 2C.30 Speed Reduction Signs (W3-5, W3-5a)—removal of R2-5 Series Reduced Speed Ahead signs and use of W3-5 or W3-5a warning signs instead—15 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.31 Merge Signs (W4-1, W4-5)—Entering Roadway Merge sign (W4-1a)—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.32 Added Lane Signs (W4-3, W4-6)—Entering Roadway Added Lane sign (W4-3a)—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.33 Lane Ends Signs (W4-2, W9-1, W9-2)—new design of W4-2 sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.34 Two-Way Traffic Sign (W6-3)—transition from one-way street—5 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.37 Intersection Warning Signs (W2-1 through W2-6)—new design of Circular Intersection (W2-6) sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.40 Vehicular Traffic Signs (W8-6, W11-1, W11-5, W11-5a, W11-6, W11-8, W11-10, W11-11, W11-12, W11-14)—new symbol signs W11-1, W11-5, W11-5a, W11-6, W11-11, and W11-14—10 years from the effective date of the Final Rule for the 2003 MUTCD.**
- Section 2C.41 Nonvehicular Signs (W11-2, W11-3, W11-4, W11-7, W11-9)—elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow supplemental plaque (W16-7) if at the crossing—January 17, 2011.**
- Section 2C.53 PHOTO ENFORCED Plaque (W16-10)—new section—10 years from the effective date of the Final Rule for the 2003 MUTCD.**

- Section 2D.38 Street Name Sign (D3-1)**—symbol sizes, 150 mm (6 in) letter sizes for lettering on ground-mounted Street Name signs on roads that are not multi-lane streets with speed limits greater than 60 km/h (40 mph), other new provisions of Millennium Edition—January 9, 2012.
- Section 2D.38 Street Name Sign (D3-1)**—letter sizes on ground-mounted signs on multi-lane streets with speed limits greater than 60 km/h (40 mph) and letter sizes on overhead-mounted signs—15 years from the effective date of the Final Rule of the 2003 MUTCD.
- Section 2D.39 Advance Street Name Signs (D3-2)**—new section in 2000 MUTCD and revisions in 2003 MUTCD—15 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 2D.45 General Service Signs (D9 Series)**—Traveler Info Call 511 (D12-5) sign, Channel 9 Monitored (D12-3) sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 2D.46 Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a)**—location and spacing of Reference Location signs and design of Intermediate Reference Location signs—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 2E.28 Interchange Exit Numbering**—size of exit number plaque—January 17, 2008.
- Section 2E.28 Interchange Exit Numbering**—LEFT on exit number plaques for left exits—5 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 2E.30 Advance Guide Signs**—advance placement distance—January 17, 2008.
- Section 2E.54 Reference Location Signs and Enhanced Reference Location Signs (D10-4, D10-5)**—design of Enhanced Reference Location signs and Intermediate Enhanced Reference Location signs—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 2E.59 Preferential Only Lane Signs**—new section in 2003 Edition—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 2F.05 Size of Lettering**—minimum height of letters and numerals on specific service signs—January 17, 2011.
- Section 2I.03 EVACUATION ROUTE Sign (EM-1)**—new design and size of EM-1 sign—15 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 3B.01 Yellow Centerline Pavement Markings and Warrants**—new section in Millennium Edition—January 3, 2003.
- Section 3B.03 Other Yellow Longitudinal Pavement Markings**—spacing requirements for pavement marking arrows in two-way left-turn lanes—5 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 3B.07 Warrants for Use of Edge Lines**—new section in Millennium Edition—January 3, 2003.
- Section 3B.17 Crosswalk Markings**—gap between transverse lines of a crosswalk—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 3B.19 Pavement Word and Symbol Markings**—typical spacing of lane-use arrows in two-way left-turn lanes shown in Figure 3B-7—5 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 3C.01 Object Marker Design and Placement Height**—width of stripes on Type 3 striped marker—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 4D.01 General**—location of signalized midblock crosswalks—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 4D.05 Application of Steady Signal Indications**—Item B.4 in STANDARD—5 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 4D.12 Flashing Operation of Traffic Control Signals**—duration of steady red clearance interval in change from red-red flashing mode to steady (stop-and-go) mode—10 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 4E.06 Accessible Pedestrian Signals**—new section in Millennium Edition—January 17, 2005.
- Section 4E.07 Countdown Pedestrian Signals**—new section—10 years from the effective date of the Final Rule for the 2003 MUTCD for countdown pedestrian signal hardware; 3 years from the effective date of the Final Rule for the 2003 MUTCD for operational requirements of countdown pedestrian signals.
- Section 4E.09 Accessible Pedestrian Signal Detectors**—new section in Millennium Edition—January 17, 2005.
- Section 4E.10 Pedestrian Intervals and Signal Phases**—pedestrian clearance time sufficient to travel to far side of the traveled way—5 years from the effective date of the Final Rule for the 2003 MUTCD.
- Section 5C.05 NARROW BRIDGE Sign (W5-2)**—elimination of symbol sign—10 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 6D.01 Pedestrian Considerations—all new provisions for pedestrian accessibility—5 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 6D.02 Accessibility Considerations—5 years from the effective date of the Final Rule for the MUTCD.

Section 6D.03 Worker Safety Considerations—high-visibility apparel requirements—3 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 6E.02 High-Visibility Safety Apparel—high-visibility apparel requirements for flaggers—3 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 6F.03 Sign Placement—crashworthiness of sign supports—January 17, 2005.

Section 6F.58 Channelizing Devices—crashworthiness—January 17, 2005.

Section 6F.59 Cones—width of retroreflective stripes—5 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 6F.63 Type I, II, or III Barricades—crashworthiness—January 17, 2005.

Section 6F.66 Longitudinal Channelizing Barricades—crashworthiness—January 17, 2005.

Section 6F.82 Crash Cushions—crashworthiness—January 17, 2005.

Section 7B.08 School Advance Warning Assembly (S1-1 with Supplemental Plaque)—use of AHEAD plaque (W16-9p) or distance plaque (W16-2 or W16-2a)—January 17, 2011.

Section 7B.09 School Crosswalk Warning Assembly (S1-1 with Diagonal Arrow)—elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow supplemental plaque (W16-7)—January 17, 2011.

Section 7B.12 Reduced Speed School Zone Ahead Sign (S4-5, S4-5a)—15 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 7E.04 Uniform of Adult Crossing Guards and Student Patrols—requirement for high-visibility apparel for adult crossing guards—5 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 8B.03 Highway-Rail Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Sign (R15-2)—retroreflective strip on crossbuck support—January 17, 2011.

Section 8B.04 Highway-Rail Grade Crossing Advance Warning Signs (W10 Series)—removal of existing W10-6 series signs—January 17, 2006.

Section 8D.07 Traffic Control Signals at or Near Highway-Rail Grade Crossings—pre-signals—10 years from the effective date of the Final Rule for the 2003 MUTCD.

Section 9B.04 Bicycle Lane Signs (R3-17, R3-17a, R3-17b)—deletion of preferential lane symbol (diamond) for bicycle lane signs—January 17, 2006.

Section 9B.17 Bicycle Warning Sign (W11-1)—elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow supplemental plaque (W16-7) if at the crossing—January 17, 2011.

Chapter 9C Markings—deletion of preferential lane symbol (diamond) for bicycle pavement markings—January 17, 2007.

Part 10 Traffic Controls for Highway-Light Rail Transit Grade Crossings—automatic gates, flashing-light signals, and blank-out signs—January 17, 2011.

Section 10C.15 Highway-Rail Grade Crossing Advance Warning Signs (W10 Series)—removal of existing W10-6 series signs—January 17, 2006.

Option:

In order for maintenance personnel to understand what to do when replacing a damaged non-compliant traffic control device, agencies may establish a policy regarding whether to replace the device in kind or to replace it with a compliant device.

Support:

Often it is desirable to upgrade to a compliant device at the time of this maintenance of a damaged device. However, it might be appropriate to replace the damaged non-compliant device in kind at the time of this maintenance activity if engineering judgment indicates that:

- A. One compliant device in the midst of a series of adjacent non-compliant devices could potentially be confusing to road users; and/or
- B. The anticipated schedule for replacement of the whole series of non-compliant devices will result in achieving timely compliance with the MUTCD.

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