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# MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES PART 1: FUNDAMENTALS

<b>Main Category:</b>	Civil Engineering
<b>Sub Category:</b>	Traffic Engineering
<b>Course #:</b>	TRA-114
<b>Course Content:</b>	64 pgs
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## Exam Preview:

1. 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, bikeway, or private road open to public travel (see definition in Section 1A.13) in accordance with 23 U.S.C. 109(d) and 402(a).
  - a. True
  - b. False
2. Uniformity assists public highway officials through efficiency in manufacture, installation, maintenance, & administration. Uniformity means treating similar situations in a similar way. The use of a uniform traffic control devices in itself constitutes uniformity.
  - a. True
  - b. False
3. 23 CFR 655.603 also states that traffic control devices on all streets, highways, bikeways, and private roads open to public travel in each State shall be in substantial conformance with standards issued or endorsed by the \_\_\_\_
  - a. Local official
  - b. State official
  - c. Local inspector
  - d. Federal Highway Administrator

4. The responsibility for the design, placement, operation, maintenance, and uniformity of traffic control devices shall rest with the public agency or the official having jurisdiction, or, in the case of private roads open to public travel, with the private owner or private official having jurisdiction.
  - a. True
  - b. False
5. Design, application, and placement of traffic control devices other than those adopted in this the Uniform Traffic control Devices (MUTCD) manual shall be allowed under state jurisdiction.
  - a. True
  - b. False
6. A jurisdiction, toll facility operator, or owner of a \_\_\_\_ road open to public travel that desires to use a traffic control device for which FHWA has issued an interim approval shall request permission from FHWA.
  - a. Private
  - b. Public
  - c. Government
  - d. Military
7. The MUTCD color code established meanings based on color. Orange is used for:
  - a. Regulation
  - b. Temporary traffic control
  - c. Regulation
  - d. Warning
8. Center Line Markings—the yellow pavement marking line(s) that delineates the separation of traffic lanes that have opposite directions of travel on a roadway. These markings need not be at the geometrical center of the pavement.
  - a. True
  - b. False
9. Circulatory Intersection—the roadway within a circular intersection on which traffic ravel in a counterclockwise direction around an island in the center of the circular intersection.
  - a. True
  - b. False
10. Abbreviations Used on Traffic Control Devices – CNG stands for:
  - a. CB Radio
  - b. Center
  - c. Circle
  - d. Compressed Natural Gas

# Manual on Uniform Traffic Control Devices

for Streets and Highways

2009 Edition

## PART 1: FUNDAMENTALS



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 Automobile Association (AAA)  
1000 AAA Drive  
Heathrow, FL 32746  
[www.aaa.com](http://www.aaa.com)  
800-222-4357

American Association of State Highway and Transportation Officials (AASHTO)  
444 North Capitol Street, NW, Suite 249  
Washington, DC 20001  
[www.transportation.org](http://www.transportation.org)  
202-624-5800

American National Standards Institute (ANSI)  
1819 L Street, NW, 6th Floor  
Washington, DC 20036  
[www.ansi.org](http://www.ansi.org)  
202-293-8020

American Railway Engineering and Maintenance-of-Way Association (AREMA)  
10003 Derekwood Lane, Suite 210  
Lanham, MD 20706  
[www.arema.org](http://www.arema.org)  
301-459-3200

Federal Highway Administration Report Center  
Facsimile number: 814-239-2156  
[report.center@fhwa.dot.gov](mailto:report.center@fhwa.dot.gov)

Illuminating Engineering Society (IES)  
120 Wall Street, Floor 17  
New York, NY 10005  
[www.iesna.org](http://www.iesna.org)  
212-248-5000

Institute of Makers of Explosives  
1120 19th Street, NW, Suite 310  
Washington, DC 20036-3605  
[www.ime.org](http://www.ime.org)  
202-429-9280

Institute of Transportation Engineers (ITE)  
1099 14th Street, NW, Suite 300 West  
Washington, DC 20005-3438  
[www.ite.org](http://www.ite.org)  
202-289-0222

International Organization for Standardization  
1, ch. de la Voie-Creuse  
Case Postale 56  
CH-1211  
Geneva 20, Switzerland  
[www.iso.ch](http://www.iso.ch)  
011-41-22-749-0111

International Safety Equipment Association (ISEA)  
1901 North Moore Street, Suite 808  
Arlington, VA 22209  
[www.safetysystem.org](http://www.safetysystem.org)  
703-525-1695

National Committee on Uniform Traffic Laws and Ordinances (NCUTLO)  
107 South West Street, Suite 110  
Alexandria, VA 22314  
[www.ncutlo.org](http://www.ncutlo.org)  
800-807-5290

National Electrical Manufacturers Association (NEMA)  
1300 North 17th Street, Suite 1752  
Rosslyn, VA 22209  
[www.nema.org](http://www.nema.org)  
703-841-3200

Occupational Safety and Health Administration (OSHA)  
U.S. Department of Labor  
200 Constitution Avenue, NW  
Washington, DC 20210  
[www.osha.gov](http://www.osha.gov)  
800-321-6742

Transportation Research Board (TRB)  
The National Academies  
500 Fifth Street, NW  
Washington, DC 20001  
[www.nas.edu/trb](http://www.nas.edu/trb)  
202-334-3072

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](http://www.access-board.gov)  
202-272-0080

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# MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

## TABLE OF CONTENTS

	<u>Page</u>
<b>INTRODUCTION.....</b>	<b>I-1</b>
 <b>PART 1. GENERAL</b>	
<b><u>CHAPTER 1A. GENERAL</u></b>	
Section 1A.01 Purpose of Traffic Control Devices.....	1
Section 1A.02 Principles of Traffic Control Devices.....	1
Section 1A.03 Design of Traffic Control Devices.....	1
Section 1A.04 Placement and Operation of Traffic Control Devices.....	2
Section 1A.05 Maintenance of Traffic Control Devices .....	2
Section 1A.06 Uniformity of Traffic Control Devices.....	2
Section 1A.07 Responsibility for Traffic Control Devices.....	2
Section 1A.08 Authority for Placement of Traffic Control Devices .....	3
Section 1A.09 Engineering Study and Engineering Judgment .....	4
Section 1A.10 Interpretations, Experimentations, Changes, and Interim Approvals .....	4
Section 1A.11 Relation to Other Publications .....	7
Section 1A.12 Color Code .....	10
Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual .....	10
Section 1A.14 Meanings of Acronyms and Abbreviations in this Manual.....	23
Section 1A.15 Abbreviations Used on Traffic Control Devices.....	24
 <b>PART 2. SIGNS</b>	
<b><u>CHAPTER 2A. GENERAL</u></b>	
Section 2A.01 Function and Purpose of Signs .....	27
Section 2A.02 Definitions .....	27
Section 2A.03 Standardization of Application .....	27
Section 2A.04 Excessive Use of Signs.....	27
Section 2A.05 Classification of Signs .....	28
Section 2A.06 Design of Signs .....	28
Section 2A.07 Retroreflectivity and Illumination.....	29
Section 2A.08 Maintaining Minimum Retroreflectivity.....	30
Section 2A.09 Shapes .....	32
Section 2A.10 Sign Colors.....	32
Section 2A.11 Dimensions.....	32
Section 2A.12 Symbols.....	34
Section 2A.13 Word Messages .....	35
Section 2A.14 Sign Borders.....	36
Section 2A.15 Enhanced Conspicuity for Standard Signs.....	36
Section 2A.16 Standardization of Location.....	37
Section 2A.17 Overhead Sign Installations .....	41
Section 2A.18 Mounting Height .....	42
Section 2A.19 Lateral Offset .....	43
Section 2A.20 Orientation .....	43
Section 2A.21 Posts and Mountings .....	44
Section 2A.22 Maintenance.....	44
Section 2A.23 Median Opening Treatments for Divided Highways with Wide Medians .....	44



**CHAPTER 2B. REGULATORY SIGNS, BARRICADES, AND GATES**

Section 2B.01	Application of Regulatory Signs .....	45
Section 2B.02	Design of Regulatory Signs.....	45
Section 2B.03	Size of Regulatory Signs .....	45
Section 2B.04	Right-of-Way at Intersections.....	49
Section 2B.05	STOP Sign (R1-1) and ALL WAY Plaque (R1-3P) .....	51
Section 2B.06	STOP Sign Applications.....	52
Section 2B.07	Multi-Way Stop Applications .....	52
Section 2B.08	YIELD Sign (R1-2) .....	53
Section 2B.09	YIELD Sign Applications .....	53
Section 2B.10	STOP Sign or YIELD Sign Placement.....	53
Section 2B.11	Yield Here To Pedestrians Signs and Stop Here For Pedestrians Signs (R1-5 Series) .....	54
Section 2B.12	In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9, and R1-9a).....	55
Section 2B.13	Speed Limit Sign (R2-1) .....	56
Section 2B.14	Truck Speed Limit Plaque (R2-2P).....	58
Section 2B.15	Night Speed Limit Plaque (R2-3P).....	58
Section 2B.16	Minimum Speed Limit Plaque (R2-4P) .....	59
Section 2B.17	Higher Fines Signs and Plaque (R2-6P, R2-10, and R2-11) .....	59
Section 2B.18	Movement Prohibition Signs (R3-1 through R3-4, R3-18, and R3-27).....	60
Section 2B.19	Intersection Lane Control Signs (R3-5 through R3-8).....	61
Section 2B.20	Mandatory Movement Lane Control Signs (R3-5, R3-5a, R3-7, and R3-20) .....	62
Section 2B.21	Optional Movement Lane Control Sign (R3-6).....	63
Section 2B.22	Advance Intersection Lane Control Signs (R3-8 Series).....	64
Section 2B.23	RIGHT (LEFT) LANE MUST EXIT Sign (R3-33) .....	64
Section 2B.24	Two-Way Left Turn Only Signs (R3-9a, R3-9b) .....	64
Section 2B.25	BEGIN and END Plaques (R3-9cP, R3-9dP).....	64
Section 2B.26	Reversible Lane Control Signs (R3-9e through R3-9i) .....	65
Section 2B.27	Jughandle Signs (R3-23, R3-24, R3-25, and R3-26 Series).....	67
Section 2B.28	DO NOT PASS Sign (R4-1) .....	72
Section 2B.29	PASS WITH CARE Sign (R4-2) .....	73
Section 2B.30	KEEP RIGHT EXCEPT TO PASS Sign (R4-16) and SLOWER TRAFFIC KEEP RIGHT Sign (R4-3).....	73
Section 2B.31	TRUCKS USE RIGHT LANE Sign (R4-5).....	73
Section 2B.32	Keep Right and Keep Left Signs (R4-7, R4-8).....	73
Section 2B.33	STAY IN LANE Sign (R4-9).....	74
Section 2B.34	RUNAWAY VEHICLES ONLY Sign (R4-10).....	74
Section 2B.35	Slow Vehicle Turn-Out Signs (R4-12, R4-13, and R4-14) .....	74
Section 2B.36	DO NOT DRIVE ON SHOULDER Sign (R4-17) and DO NOT PASS ON SHOULDER Sign (R4-18) .....	75
Section 2B.37	DO NOT ENTER Sign (R5-1) .....	75
Section 2B.38	WRONG WAY Sign (R5-1a).....	76
Section 2B.39	Selective Exclusion Signs .....	76
Section 2B.40	ONE WAY Signs (R6-1, R6-2).....	77
Section 2B.41	Wrong-Way Traffic Control at Interchange Ramps .....	79
Section 2B.42	Divided Highway Crossing Signs (R6-3, R6-3a) .....	82
Section 2B.43	Roundabout Directional Arrow Signs (R6-4, R6-4a, and R6-4b).....	84
Section 2B.44	Roundabout Circulation Plaque (R6-5P) .....	84
Section 2B.45	Examples of Roundabout Signing .....	84
Section 2B.46	Parking, Standing, and Stopping Signs (R7 and R8 Series) .....	88
Section 2B.47	Design of Parking, Standing, and Stopping Signs.....	89
Section 2B.48	Placement of Parking, Stopping, and Standing Signs .....	92
Section 2B.49	Emergency Restriction Signs (R8-4, R8-7, R8-8).....	92
Section 2B.50	WALK ON LEFT FACING TRAFFIC and No Hitchhiking Signs (R9-1, R9-4, R9-4a) .....	92



Section 2B.51	Pedestrian Crossing Signs (R9-2, R9-3).....	92
Section 2B.52	Traffic Signal Pedestrian and Bicycle Actuation Signs (R10-1 through R10-4, and R10-24 through R10-26) .....	94
Section 2B.53	Traffic Signal Signs (R10-5 through R10-30).....	95
Section 2B.54	No Turn on Red Signs (R10-11 Series, R10-17a, and R10-30) .....	95
Section 2B.55	Photo Enforced Signs and Plaques (R10-18, R10-19P, R10-19aP).....	97
Section 2B.56	Ramp Metering Signs (R10-28 and R10-29) .....	97
Section 2B.57	KEEP OFF MEDIAN Sign (R11-1) .....	97
Section 2B.58	ROAD CLOSED Sign (R11-2) and LOCAL TRAFFIC ONLY Signs (R11-3 Series, R11-4) ...	98
Section 2B.59	Weight Limit Signs (R12-1 through R12-5) .....	98
Section 2B.60	Weigh Station Signs (R13 Series).....	99
Section 2B.61	TRUCK ROUTE Sign (R14-1).....	99
Section 2B.62	Hazardous Material Signs (R14-2, R14-3).....	99
Section 2B.63	National Network Signs (R14-4, R14-5) .....	100
Section 2B.64	Headlight Use Signs (R16-5 through R16-11) .....	100
Section 2B.65	FENDER BENDER Sign (R16-4) .....	101
Section 2B.66	Seat Belt Symbol .....	101
Section 2B.67	Barricades .....	101
Section 2B.68	Gates .....	101

## **CHAPTER 2C. WARNING SIGNS AND OBJECT MARKERS**

Section 2C.01	Function of Warning Signs.....	103
Section 2C.02	Application of Warning Signs .....	103
Section 2C.03	Design of Warning Signs .....	103
Section 2C.04	Size of Warning Signs.....	103
Section 2C.05	Placement of Warning Signs .....	108
Section 2C.06	Horizontal Alignment Warning Signs.....	109
Section 2C.07	Horizontal Alignment Signs (W1-1 through W1-5, W1-11, W1-15) .....	110
Section 2C.08	Advisory Speed Plaque (W13-1P).....	112
Section 2C.09	Chevron Alignment Sign (W1-8) .....	112
Section 2C.10	Combination Horizontal Alignment/Advisory Speed Signs (W1-1a, W1-2a) .....	113
Section 2C.11	Combination Horizontal Alignment/Intersection Signs (W1-10 Series) .....	113
Section 2C.12	One-Direction Large Arrow Sign (W1-6).....	113
Section 2C.13	Truck Rollover Warning Sign (W1-13).....	114
Section 2C.14	Advisory Exit and Ramp Speed Signs (W13-2 and W13-3).....	114
Section 2C.15	Combination Horizontal Alignment/Advisory Exit and Ramp Speed Signs (W13-6 and W13-7).....	115
Section 2C.16	Hill Signs (W7-1, W7-1a) .....	115
Section 2C.17	Truck Escape Ramp Signs (W7-4 Series) .....	115
Section 2C.18	HILL BLOCKS VIEW Sign (W7-6) .....	117
Section 2C.19	ROAD NARROWS Sign (W5-1).....	117
Section 2C.20	NARROW BRIDGE Sign (W5-2).....	118
Section 2C.21	ONE LANE BRIDGE Sign (W5-3) .....	118
Section 2C.22	Divided Highway Sign (W6-1) .....	119
Section 2C.23	Divided Highway Ends Sign (W6-2).....	119
Section 2C.24	Freeway or Expressway Ends Signs (W19 Series).....	119
Section 2C.25	Double Arrow Sign (W12-1) .....	119
Section 2C.26	DEAD END/NO OUTLET Signs (W14-1, W14-1a, W14-2, W14-2a) .....	119
Section 2C.27	Low Clearance Signs (W12-2 and W12-2a) .....	120
Section 2C.28	BUMP and DIP Signs (W8-1, W8-2) .....	120
Section 2C.29	SPEED HUMP Sign (W17-1).....	120
Section 2C.30	PAVEMENT ENDS Sign (W8-3) .....	122
Section 2C.31	Shoulder Signs (W8-4, W8-9, W8-17, W8-23, and W8-25).....	122
Section 2C.32	Surface Condition Signs (W8-5, W8-7, W8-8, W8-11, W8-13, and W8-14).....	122

Section 2C.33	Warning Signs and Plaques for Motorcyclists (W8-15, W8-15P, and W8-16).....	123
Section 2C.34	NO CENTER LINE Sign (W8-12) .....	123
Section 2C.35	Weather Condition Signs (W8-18, W8-19, W8-21, and W8-22) .....	123
Section 2C.36	Advance Traffic Control Signs (W3-1, W3-2, W3-3, W3-4) .....	123
Section 2C.37	Advance Ramp Control Signal Signs (W3-7 and W3-8) .....	124
Section 2C.38	Reduced Speed Limit Ahead Signs (W3-5, W3-5a) .....	124
Section 2C.39	DRAW BRIDGE Sign (W3-6).....	125
Section 2C.40	Merge Signs (W4-1, W4-5).....	125
Section 2C.41	Added Lane Signs (W4-3, W4-6) .....	126
Section 2C.42	Lane Ends Signs (W4-2, W9-1, W9-2) .....	126
Section 2C.43	RIGHT (LEFT) LANE EXIT ONLY AHEAD Sign (W9-7) .....	126
Section 2C.44	Two-Way Traffic Sign (W6-3) .....	127
Section 2C.45	NO PASSING ZONE Sign (W14-3).....	127
Section 2C.46	Intersection Warning Signs (W2-1 through W2-8) .....	127
Section 2C.47	Two-Direction Large Arrow Sign (W1-7) .....	128
Section 2C.48	Traffic Signal Signs (W25-1, W25-2) .....	128
Section 2C.49	Vehicular Traffic Warning Signs (W8-6, W11-1, W11-5, W11-5a, W11-8, W11-10, W11-11, W11-12P, W11-14, W11-15, and W11-15a) .....	128
Section 2C.50	Non-Vehicular Warning Signs (W11-2, W11-3, W11-4, W11-6, W11-7, W11-9, and W11-16 through W11-22).....	130
Section 2C.51	Playground Sign (W15-1) .....	131
Section 2C.52	NEW TRAFFIC PATTERN AHEAD Sign (W23-2) .....	131
Section 2C.53	Use of Supplemental Warning Plaques .....	131
Section 2C.54	Design of Supplemental Warning Plaques .....	132
Section 2C.55	Distance Plaques (W16-2 Series, W16-3 Series, W16-4P, W7-3aP).....	132
Section 2C.56	Supplemental Arrow Plaques (W16-5P, W16-6P).....	132
Section 2C.57	Hill-Related Plaques (W7-2 Series, W7-3 Series) .....	133
Section 2C.58	Advance Street Name Plaque (W16-8P, W16-8aP).....	133
Section 2C.59	CROSS TRAFFIC DOES NOT STOP Plaque (W4-4P) .....	133
Section 2C.60	SHARE THE ROAD Plaque (W16-1P) .....	133
Section 2C.61	Photo Enforced Plaque (W16-10P).....	134
Section 2C.62	NEW Plaque (W16-15P) .....	134
Section 2C.63	Object Marker Design and Placement Height .....	134
Section 2C.64	Object Markers for Obstructions Within the Roadway .....	135
Section 2C.65	Object Markers for Obstructions Adjacent to the Roadway .....	135
Section 2C.66	Object Markers for Ends of Roadways.....	136

## **CHAPTER 2D. GUIDE SIGNS—CONVENTIONAL ROADS**

Section 2D.01	Scope of Conventional Road Guide Sign Standards .....	137
Section 2D.02	Application.....	137
Section 2D.03	Color, Retroreflection, and Illumination .....	137
Section 2D.04	Size of Signs.....	137
Section 2D.05	Lettering Style.....	138
Section 2D.06	Size of Lettering.....	138
Section 2D.07	Amount of Legend .....	140
Section 2D.08	Arrows.....	140
Section 2D.09	Numbered Highway Systems .....	142
Section 2D.10	Route Signs and Auxiliary Signs .....	142
Section 2D.11	Design of Route Signs .....	143
Section 2D.12	Design of Route Sign Auxiliaries.....	144
Section 2D.13	Junction Auxiliary Sign (M2-1) .....	144
Section 2D.14	Combination Junction Sign (M2-2) .....	145
Section 2D.15	Cardinal Direction Auxiliary Signs (M3-1 through M3-4) .....	145
Section 2D.16	Auxiliary Signs for Alternative Routes (M4 Series) .....	145

Section 2D.17	ALTERNATE Auxiliary Signs (M4-1, M4-1a).....	145
Section 2D.18	BY-PASS Auxiliary Sign (M4-2) .....	146
Section 2D.19	BUSINESS Auxiliary Sign (M4-3).....	146
Section 2D.20	TRUCK Auxiliary Sign (M4-4).....	146
Section 2D.21	TO Auxiliary Sign (M4-5).....	146
Section 2D.22	END Auxiliary Sign (M4-6).....	146
Section 2D.23	BEGIN Auxiliary Sign (M4-14).....	146
Section 2D.24	TEMPORARY Auxiliary Signs (M4-7, M4-7a).....	147
Section 2D.25	Temporary Detour and Auxiliary Signs.....	147
Section 2D.26	Advance Turn Arrow Auxiliary Signs (M5-1, M5-2, and M5-3).....	147
Section 2D.27	Lane Designation Auxiliary Signs (M5-4, M5-5, and M5-6).....	148
Section 2D.28	Directional Arrow Auxiliary Signs (M6 Series).....	148
Section 2D.29	Route Sign Assemblies.....	148
Section 2D.30	Junction Assembly .....	153
Section 2D.31	Advance Route Turn Assembly .....	153
Section 2D.32	Directional Assembly .....	153
Section 2D.33	Combination Lane-Use/Destination Overhead Guide Sign (D15-1).....	154
Section 2D.34	Confirming or Reassurance Assemblies .....	155
Section 2D.35	Trailblazer Assembly .....	155
Section 2D.36	Destination and Distance Signs.....	156
Section 2D.37	Destination Signs (D1 Series).....	156
Section 2D.38	Destination Signs at Circular Intersections .....	157
Section 2D.39	Destination Signs at Jughandles .....	158
Section 2D.40	Location of Destination Signs .....	158
Section 2D.41	Distance Signs (D2 Series).....	161
Section 2D.42	Location of Distance Signs .....	161
Section 2D.43	Street Name Signs (D3-1 or D3-1a).....	161
Section 2D.44	Advance Street Name Signs (D3-2) .....	163
Section 2D.45	Signing on Conventional Roads on Approaches to Interchanges .....	164
Section 2D.46	Freeway Entrance Signs (D13-3 and D13-3a).....	170
Section 2D.47	Parking Area Guide Sign (D4-1).....	171
Section 2D.48	PARK - RIDE Sign (D4-2) .....	171
Section 2D.49	Weigh Station Signing (D8 Series).....	172
Section 2D.50	Community Wayfinding Signs .....	172
Section 2D.51	Truck, Passing, or Climbing Lane Signs (D17-1 and D17-2) .....	178
Section 2D.52	Slow Vehicle Turn-Out Sign (D17-7).....	178
Section 2D.53	Signing of Named Highways.....	179
Section 2D.54	Crossover Signs (D13-1 and D13-2) .....	179
Section 2D.55	National Scenic Byways Signs (D6-4, D6-4a).....	179

## **CHAPTER 2E. GUIDE SIGNS—FREEWAYS AND EXPRESSWAYS**

Section 2E.01	Scope of Freeway and Expressway Guide Sign Standards.....	181
Section 2E.02	Freeway and Expressway Signing Principles .....	181
Section 2E.03	Guide Sign Classification .....	181
Section 2E.04	General.....	182
Section 2E.05	Color of Guide Signs.....	182
Section 2E.06	Retroreflection or Illumination.....	182
Section 2E.07	Characteristics of Urban Signing .....	182
Section 2E.08	Characteristics of Rural Signing .....	183
Section 2E.09	Signing of Named Highways.....	183
Section 2E.10	Amount of Legend on Guide Signs.....	183
Section 2E.11	Number of Signs at an Overhead Installation and Sign Spreading .....	183
Section 2E.12	Pull-Through Signs (E6-2, E6-2a).....	184
Section 2E.13	Designation of Destinations .....	184

Section 2E.14	Size and Style of Letters and Signs.....	185
Section 2E.15	Interline and Edge Spacing .....	185
Section 2E.16	Sign Borders.....	192
Section 2E.17	Abbreviations .....	192
Section 2E.18	Symbols.....	192
Section 2E.19	Arrows for Interchange Guide Signs.....	192
Section 2E.20	Signing for Option Lanes at Splits and Multi-Lane Exits .....	193
Section 2E.21	Design of Overhead Arrow-per-Lane Guide Signs for Option Lanes .....	193
Section 2E.22	Design of Freeway and Expressway Diagrammatic Guide Signs for Option Lanes .....	198
Section 2E.23	Signing for Intermediate and Minor Interchange Multi-Lane Exits with an Option Lane.....	203
Section 2E.24	Signing for Interchange Lane Drops .....	203
Section 2E.25	Overhead Sign Installations .....	206
Section 2E.26	Lateral Offset .....	210
Section 2E.27	Route Signs and Trailblazer Assemblies .....	210
Section 2E.28	Eisenhower Interstate System Signs (M1-10, M1-10a) .....	211
Section 2E.29	Signs for Intersections at Grade .....	211
Section 2E.30	Interchange Guide Signs .....	211
Section 2E.31	Interchange Exit Numbering .....	212
Section 2E.32	Interchange Classification .....	216
Section 2E.33	Advance Guide Signs .....	216
Section 2E.34	Next Exit Plaques .....	218
Section 2E.35	Other Supplemental Guide Signs .....	218
Section 2E.36	Exit Direction Signs .....	220
Section 2E.37	Exit Gore Signs (E5-1 Series) .....	222
Section 2E.38	Post-Interchange Signs .....	222
Section 2E.39	Post-Interchange Distance Signs .....	223
Section 2E.40	Interchange Sequence Signs.....	223
Section 2E.41	Community Interchanges Identification Signs .....	225
Section 2E.42	NEXT XX EXITS Sign .....	225
Section 2E.43	Signing by Type of Interchange .....	226
Section 2E.44	Freeway-to-Freeway Interchange .....	226
Section 2E.45	Cloverleaf Interchange .....	226
Section 2E.46	Cloverleaf Interchange with Collector-Distributor Roadways.....	230
Section 2E.47	Partial Cloverleaf Interchange.....	230
Section 2E.48	Diamond Interchange.....	230
Section 2E.49	Diamond Interchange in Urban Area .....	234
Section 2E.50	Closely-Spaced Interchanges.....	234
Section 2E.51	Minor Interchange.....	234
Section 2E.52	Signing on Conventional Road Approaches and Connecting Roadways.....	235
Section 2E.53	Wrong-Way Traffic Control at Interchange Ramps .....	235
Section 2E.54	Weigh Station Signing.....	236

## **CHAPTER 2F. TOLL ROAD SIGNS**

Section 2F.01	Scope.....	237
Section 2F.02	Sizes of Toll Road Signs.....	237
Section 2F.03	Use of Purple Backgrounds and Underlay Panels with ETC Account Pictographs .....	238
Section 2F.04	Size of ETC Pictographs .....	238
Section 2F.05	Regulatory Signs for Toll Plazas .....	238
Section 2F.06	Pay Toll Advance Warning Sign (W9-6) .....	240
Section 2F.07	Pay Toll Advance Warning Plaque (W9-6P).....	241
Section 2F.08	Stop Ahead Pay Toll Warning Sign (W9-6a) .....	242
Section 2F.09	Stop Ahead Pay Toll Warning Plaque (W9-6aP) .....	242
Section 2F.10	LAST EXIT BEFORE TOLL Warning Plaque (W16-16P).....	242
Section 2F.11	TOLL Auxiliary Sign (M4-15) .....	242

Section 2F.12	Electronic Toll Collection (ETC) Account-Only Auxiliary Signs (M4-16 and M4-20).....	243
Section 2F.13	Toll Facility and Toll Plaza Guide Signs – General .....	243
Section 2F.14	Advance Signs for Conventional Toll Plazas.....	248
Section 2F.15	Advance Signs for Toll Plazas on Diverging Alignments from Open-Road ETC Account-Only Lanes .....	249
Section 2F.16	Toll Plaza Canopy Signs.....	252
Section 2F.17	Guide Signs for Entrances to ETC Account-Only Facilities .....	252
Section 2F.18	ETC Program Information Signs .....	252

## **CHAPTER 2G. PREFERENTIAL AND MANAGED LANE SIGNS**

Section 2G.01	Scope.....	253
Section 2G.02	Sizes of Preferential and Managed Lane Signs .....	253
Section 2G.03	Regulatory Signs for Preferential Lanes – General.....	253
Section 2G.04	Preferential Lane Vehicle Occupancy Definition Regulatory Signs (R3-10 Series and R3-13 Series) .....	258
Section 2G.05	Preferential Lane Periods of Operation Regulatory Signs (R3-11 Series and R3-14 Series)...	259
Section 2G.06	Preferential Lane Advance Regulatory Signs (R3-12, R3-12e, R3-12f, R3-15, R3-15a, and R3-15d).....	263
Section 2G.07	Preferential Lane Ends Regulatory Signs (R3-12a, R3-12b, R3-12c, R3-12d, R3-12g, R3-12h, R3-15b, R3-15c, and R3-15e).....	263
Section 2G.08	Warning Signs on Median Barriers for Preferential Lanes .....	263
Section 2G.09	High-Occupancy Vehicle (HOV) Plaque (W16-11P) .....	264
Section 2G.10	Preferential Lane Guide Signs – General.....	265
Section 2G.11	Guide Signs for Initial Entry Points to Preferential Lanes.....	267
Section 2G.12	Guide Signs for Intermediate Entry Points to Preferential Lanes .....	268
Section 2G.13	Guide Signs for Egress from Preferential Lanes to General-Purpose Lanes .....	270
Section 2G.14	Guide Signs for Direct Entrances to Preferential Lanes from Another Highway .....	273
Section 2G.15	Guide Signs for Direct Exits from Preferential Lanes to Another Highway .....	273
Section 2G.16	Signs for Priced Managed Lanes – General.....	276
Section 2G.17	Regulatory Signs for Priced Managed Lanes.....	279
Section 2G.18	Guide Signs for Priced Managed Lanes.....	279

## **CHAPTER 2H. GENERAL INFORMATION SIGNS**

Section 2H.01	Sizes of General Information Signs .....	292
Section 2H.02	General Information Signs (I Series).....	292
Section 2H.03	Traffic Signal Speed Sign (I1-1) .....	294
Section 2H.04	Miscellaneous Information Signs.....	294
Section 2H.05	Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a) .....	294
Section 2H.06	Enhanced Reference Location Signs (D10-4, D10-5).....	296
Section 2H.07	Auto Tour Route Signs .....	297
Section 2H.08	Acknowledgment Signs.....	297

## **CHAPTER 2I. GENERAL SERVICE SIGNS**

Section 2I.01	Sizes of General Service Signs.....	299
Section 2I.02	General Service Signs for Conventional Roads.....	300
Section 2I.03	General Service Signs for Freeways and Expressways .....	303
Section 2I.04	Interstate Oasis Signing.....	306
Section 2I.05	Rest Area and Other Roadside Area Signs.....	307
Section 2I.06	Brake Check Area Signs (D5-13 and D5-14) .....	308
Section 2I.07	Chain-Up Area Signs (D5-15 and D5-16) .....	308
Section 2I.08	Tourist Information and Welcome Center Signs .....	308
Section 2I.09	Radio Information Signing.....	310
Section 2I.10	TRAVEL INFO CALL 511 Signs (D12-5 and D12-5a).....	311
Section 2I.11	Carpool and Ridesharing Signing.....	311



**CHAPTER 2J. SPECIFIC SERVICE SIGNS**

Section 2J.01	Eligibility .....	312
Section 2J.02	Application.....	313
Section 2J.03	Logos and Logo Sign Panels .....	313
Section 2J.04	Number and Size of Signs and Logo Sign Panels .....	317
Section 2J.05	Size of Lettering.....	317
Section 2J.06	Signs at Interchanges.....	317
Section 2J.07	Single-Exit Interchanges .....	317
Section 2J.08	Double-Exit Interchanges.....	318
Section 2J.09	Specific Service Trailblazer Signs.....	318
Section 2J.10	Signs at Intersections.....	319
Section 2J.11	Signing Policy .....	319

**CHAPTER 2K. TOURIST-ORIENTED DIRECTIONAL SIGNS**

Section 2K.01	Purpose and Application .....	320
Section 2K.02	Design .....	320
Section 2K.03	Style and Size of Lettering.....	323
Section 2K.04	Arrangement and Size of Signs.....	323
Section 2K.05	Advance Signs.....	323
Section 2K.06	Sign Locations.....	324
Section 2K.07	State Policy.....	324

**CHAPTER 2L. CHANGEABLE MESSAGE SIGNS**

Section 2L.01	Description of Changeable Message Signs.....	325
Section 2L.02	Applications of Changeable Message Signs .....	325
Section 2L.03	Legibility and Visibility of Changeable Message Signs.....	326
Section 2L.04	Design Characteristics of Changeable Message Signs .....	326
Section 2L.05	Message Length and Units of Information.....	328
Section 2L.06	Installation of Permanent Changeable Message Signs .....	329

**CHAPTER 2M. RECREATIONAL AND CULTURAL INTEREST AREA SIGNS**

Section 2M.01	Scope.....	330
Section 2M.02	Application of Recreational and Cultural Interest Area Signs .....	330
Section 2M.03	Regulatory and Warning Signs .....	330
Section 2M.04	General Design Requirements for Recreational and Cultural Interest Area Symbol Guide Signs .....	330
Section 2M.05	Symbol Sign Sizes.....	332
Section 2M.06	Use of Educational Plaques .....	332
Section 2M.07	Use of Prohibitive Circle and Diagonal Slash for Non-Road Applications .....	332
Section 2M.08	Placement of Recreational and Cultural Interest Area Symbol Signs.....	332
Section 2M.09	Destination Guide Signs.....	333
Section 2M.10	Memorial or Dedication Signing.....	339

**CHAPTER 2N. EMERGENCY MANAGEMENT SIGNING**

Section 2N.01	Emergency Management.....	342
Section 2N.02	Design of Emergency Management Signs.....	342
Section 2N.03	Evacuation Route Signs (EM-1 and EM-1a).....	342
Section 2N.04	AREA CLOSED Sign (EM-2) .....	344
Section 2N.05	TRAFFIC CONTROL POINT Sign (EM-3) .....	344
Section 2N.06	MAINTAIN TOP SAFE SPEED Sign (EM-4) .....	344
Section 2N.07	ROAD (AREA) USE PERMIT REQUIRED FOR THRU TRAFFIC Sign (EM-5) .....	345
Section 2N.08	Emergency Aid Center Signs (EM-6 Series).....	345
Section 2N.09	Shelter Directional Signs (EM-7 Series) .....	346

## **PART 3. MARKINGS**

### **CHAPTER 3A. GENERAL**

Section 3A.01	Functions and Limitations.....	347
Section 3A.02	Standardization of Application .....	347
Section 3A.03	Maintaining Minimum Pavement Marking Retroreflectivity .....	347
Section 3A.04	Materials .....	347
Section 3A.05	Colors .....	348
Section 3A.06	Functions, Widths, and Patterns of Longitudinal Pavement Markings .....	348

### **CHAPTER 3B. PAVEMENT AND CURB MARKINGS**

Section 3B.01	Yellow Center Line Pavement Markings and Warrants .....	349
Section 3B.02	No-Passing Zone Pavement Markings and Warrants .....	352
Section 3B.03	Other Yellow Longitudinal Pavement Markings .....	354
Section 3B.04	White Lane Line Pavement Markings and Warrants .....	356
Section 3B.05	Other White Longitudinal Pavement Markings .....	370
Section 3B.06	Edge Line Pavement Markings .....	371
Section 3B.07	Warrants for Use of Edge Lines .....	371
Section 3B.08	Extensions Through Intersections or Interchanges .....	371
Section 3B.09	Lane-Reduction Transition Markings .....	374
Section 3B.10	Approach Markings for Obstructions.....	376
Section 3B.11	Raised Pavement Markers – General .....	376
Section 3B.12	Raised Pavement Markers as Vehicle Positioning Guides with Other Longitudinal Markings .....	379
Section 3B.13	Raised Pavement Markers Supplementing Other Markings.....	379
Section 3B.14	Raised Pavement Markers Substituting for Pavement Markings.....	380
Section 3B.15	Transverse Markings.....	381
Section 3B.16	Stop and Yield Lines.....	381
Section 3B.17	Do Not Block Intersection Markings .....	382
Section 3B.18	Crosswalk Markings .....	383
Section 3B.19	Parking Space Markings .....	385
Section 3B.20	Pavement Word, Symbol, and Arrow Markings.....	387
Section 3B.21	Speed Measurement Markings.....	393
Section 3B.22	Speed Reduction Markings .....	393
Section 3B.23	Curb Markings .....	394
Section 3B.24	Chevron and Diagonal Crosshatch Markings.....	395
Section 3B.25	Speed Hump Markings .....	395
Section 3B.26	Advance Speed Hump Markings .....	395

### **CHAPTER 3C. ROUNDABOUT MARKINGS**

Section 3C.01	General .....	399
Section 3C.02	White Lane Line Pavement Markings for Roundabouts .....	413
Section 3C.03	Edge Line Pavement Markings for Roundabout Circulatory Roadways .....	413
Section 3C.04	Yield Lines for Roundabouts.....	413
Section 3C.05	Crosswalk Markings at Roundabouts.....	413
Section 3C.06	Word, Symbol, and Arrow Pavement Markings for Roundabouts .....	413
Section 3C.07	Markings for Other Circular Intersections.....	414

### **CHAPTER 3D. MARKINGS FOR PREFERENTIAL LANES**

Section 3D.01	Preferential Lane Word and Symbol Markings.....	415
Section 3D.02	Preferential Lane Longitudinal Markings for Motor Vehicles .....	416

### **CHAPTER 3E. MARKINGS FOR TOLL PLAZAS**

Section 3E.01	Markings for Toll Plazas .....	423
---------------	--------------------------------	-----



**CHAPTER 3F DELINEATORS**

Section 3F.01	Delineators .....	424
Section 3F.02	Delineator Design .....	424
Section 3F.03	Delineator Application .....	424
Section 3F.04	Delineator Placement and Spacing.....	426

**CHAPTER 3G COLORED PAVEMENTS**

Section 3G.01	General .....	428
---------------	---------------	-----

**CHAPTER 3H CHANNELIZING DEVICES USED FOR EMPHASIS OF PAVEMENT MARKING PATTERNS**

Section 3H.01	Channelizing Devices .....	429
---------------	----------------------------	-----

**CHAPTER 3I ISLANDS**

Section 3I.01	General .....	430
Section 3I.02	Approach-End Treatment .....	430
Section 3I.03	Island Marking Application .....	430
Section 3I.04	Island Marking Colors .....	430
Section 3I.05	Island Delineation .....	431
Section 3I.06	Pedestrian Islands and Medians .....	431

**CHAPTER 3J RUMBLE STRIP MARKINGS**

Section 3J.01	Longitudinal Rumble Strip Markings .....	432
Section 3J.02	Transverse Rumble Strip Markings.....	432

**PART 4 HIGHWAY TRAFFIC SIGNALS****CHAPTER 4A GENERAL**

Section 4A.01	Types .....	433
Section 4A.02	Definitions Relating to Highway Traffic Signals.....	433

**CHAPTER 4B TRAFFIC CONTROL SIGNALS—GENERAL**

Section 4B.01	General .....	434
Section 4B.02	Basis of Installation or Removal of Traffic Control Signals.....	434
Section 4B.03	Advantages and Disadvantages of Traffic Control Signals .....	434
Section 4B.04	Alternatives to Traffic Control Signals.....	435
Section 4B.05	Adequate Roadway Capacity.....	435

**CHAPTER 4C TRAFFIC CONTROL SIGNAL NEEDS STUDIES**

Section 4C.01	Studies and Factors for Justifying Traffic Control Signals.....	436
Section 4C.02	Warrant 1, Eight-Hour Vehicular Volume .....	437
Section 4C.03	Warrant 2, Four-Hour Vehicular Volume.....	439
Section 4C.04	Warrant 3, Peak Hour.....	439
Section 4C.05	Warrant 4, Pedestrian Volume .....	442
Section 4C.06	Warrant 5, School Crossing.....	442
Section 4C.07	Warrant 6, Coordinated Signal System .....	445
Section 4C.08	Warrant 7, Crash Experience.....	445
Section 4C.09	Warrant 8, Roadway Network .....	446
Section 4C.10	Warrant 9, Intersection Near a Grade Crossing .....	446

**CHAPTER 4D TRAFFIC CONTROL SIGNAL FEATURES**

Section 4D.01	General .....	449
Section 4D.02	Responsibility for Operation and Maintenance.....	449
Section 4D.03	Provisions for Pedestrians .....	450
Section 4D.04	Meaning of Vehicular Signal Indications.....	450

Section 4D.05	Application of Steady Signal Indications .....	453
Section 4D.06	Signal Indications – Design, Illumination, Color, and Shape.....	456
Section 4D.07	Size of Vehicular Signal Indications .....	456
Section 4D.08	Positions of Signal Indications Within a Signal Face – General .....	457
Section 4D.09	Positions of Signal Indications Within a Vertical Signal Face .....	457
Section 4D.10	Positions of Signal Indications Within a Horizontal Signal Face.....	459
Section 4D.11	Number of Signal Faces on an Approach.....	459
Section 4D.12	Visibility, Aiming, and Shielding of Signal Faces .....	461
Section 4D.13	Lateral Positioning of Signal Faces.....	463
Section 4D.14	Longitudinal Positioning of Signal Faces.....	464
Section 4D.15	Mounting Height of Signal Faces.....	465
Section 4D.16	Lateral Offset (Clearance) of Signal Faces.....	465
Section 4D.17	Signal Indications for Left-Turn Movements – General .....	465
Section 4D.18	Signal Indications for Permissive Only Mode Left-Turn Movements .....	467
Section 4D.19	Signal Indications for Protected Only Mode Left-Turn Movements .....	469
Section 4D.20	Signal Indications for Protected/Permissive Mode Left-Turn Movements.....	471
Section 4D.21	Signal Indications for Right-Turn Movements – General .....	474
Section 4D.22	Signal Indications for Permissive Only Mode Right-Turn Movements .....	475
Section 4D.23	Signal Indications for Protected Only Mode Right-Turn Movements .....	478
Section 4D.24	Signal Indications for Protected/Permissive Mode Right-Turn Movements .....	480
Section 4D.25	Signal Indications for Approaches With Shared Left-Turn/Right-Turn Lanes and No Through Movement.....	484
Section 4D.26	Yellow Change and Red Clearance Intervals .....	485
Section 4D.27	Preemption and Priority Control of Traffic Control Signals .....	489
Section 4D.28	Flashing Operation of Traffic Control Signals – General .....	491
Section 4D.29	Flashing Operation – Transition Into Flashing Mode .....	491
Section 4D.30	Flashing Operation – Signal Indications During Flashing Mode .....	491
Section 4D.31	Flashing Operation – Transition Out of Flashing Mode .....	492
Section 4D.32	Temporary and Portable Traffic Control Signals .....	492
Section 4D.33	Lateral Offset of Signal Supports and Cabinets .....	493
Section 4D.34	Use of Signs at Signalized Locations .....	493
Section 4D.35	Use of Pavement Markings at Signalized Locations .....	494

## **CHAPTER 4E PEDESTRIAN CONTROL FEATURES**

Section 4E.01	Pedestrian Signal Heads.....	495
Section 4E.02	Meaning of Pedestrian Signal Head Indications .....	495
Section 4E.03	Application of Pedestrian Signal Heads .....	495
Section 4E.04	Size, Design, and Illumination of Pedestrian Signal Head Indications.....	496
Section 4E.05	Location and Height of Pedestrian Signal Heads.....	497
Section 4E.06	Pedestrian Intervals and Signal Phases .....	497
Section 4E.07	Countdown Pedestrian Signals.....	499
Section 4E.08	Pedestrian Detectors .....	500
Section 4E.09	Accessible Pedestrian Signals and Detectors – General .....	504
Section 4E.10	Accessible Pedestrian Signals and Detectors – Location .....	505
Section 4E.11	Accessible Pedestrian Signals and Detectors – Walk Indications.....	505
Section 4E.12	Accessible Pedestrian Signals and Detectors – Tactile Arrows and Locator Tones.....	507
Section 4E.13	Accessible Pedestrian Signals and Detectors – Extended Pushbutton Press Features .....	507

## **CHAPTER 4F PEDESTRIAN HYBRID BEACONS**

Section 4F.01	Application of Pedestrian Hybrid Beacons .....	509
Section 4F.02	Design of Pedestrian Hybrid Beacons.....	509
Section 4F.03	Operation of Pedestrian Hybrid Beacons .....	511

## **CHAPTER 4G TRAFFIC CONTROL SIGNALS AND HYBRID BEACONS FOR EMERGENCY-VEHICLE ACCESS**

Section 4G.01	Application of Emergency-Vehicle Traffic Control Signals and Hybrid Beacons .....	513
Section 4G.02	Design of Emergency-Vehicle Traffic Control Signals .....	513
Section 4G.03	Operation of Emergency-Vehicle Traffic Control Signals .....	513
Section 4G.04	Emergency-Vehicle Hybrid Beacons .....	514

## **CHAPTER 4H TRAFFIC CONTROL SIGNALS FOR ONE-LANE, TWO-WAY FACILITIES**

Section 4H.01	Application of Traffic Control Signals for One-Lane, Two-Way Facilities .....	516
Section 4H.02	Design of Traffic Control Signals for One-Lane, Two-Way Facilities.....	516
Section 4H.03	Operation of Traffic Control Signals for One-Lane, Two-Way Facilities.....	516

## **CHAPTER 4I TRAFFIC CONTROL SIGNALS FOR FREEWAY ENTRANCE RAMPS**

Section 4I.01	Application of Freeway Entrance Ramp Control Signals.....	517
Section 4I.02	Design of Freeway Entrance Ramp Control Signals .....	517
Section 4I.03	Operation of Freeway Entrance Ramp Control Signals .....	518

## **CHAPTER 4J TRAFFIC CONTROL FOR MOVABLE BRIDGES**

Section 4J.01	Application of Traffic Control for Movable Bridges .....	519
Section 4J.02	Design and Location of Movable Bridge Signals and Gates .....	519
Section 4J.03	Operation of Movable Bridge Signals and Gates .....	521

## **CHAPTER 4K HIGHWAY TRAFFIC SIGNALS AT TOLL PLAZAS**

Section 4K.01	Traffic Signals at Toll Plazas .....	522
Section 4K.02	Lane-Use Control Signals at or Near Toll Plazas .....	522
Section 4K.03	Warning Beacons at Toll Plazas .....	522

## **CHAPTER 4L FLASHING BEACONS**

Section 4L.01	General Design and Operation of Flashing Beacons .....	523
Section 4L.02	Intersection Control Beacon.....	523
Section 4L.03	Warning Beacon.....	523
Section 4L.04	Speed Limit Sign Beacon.....	524
Section 4L.05	Stop Beacon .....	524

## **CHAPTER 4M LANE-USE CONTROL SIGNALS**

Section 4M.01	Application of Lane-Use Control Signals .....	525
Section 4M.02	Meaning of Lane-Use Control Signal Indications.....	525
Section 4M.03	Design of Lane-Use Control Signals.....	526
Section 4M.04	Operation of Lane-Use Control Signals .....	527

## **CHAPTER 4N IN-ROADWAY LIGHTS**

Section 4N.01	Application of In-Roadway Lights .....	528
Section 4N.02	In-Roadway Warning Lights at Crosswalks.....	528

# **PART 5 TRAFFIC CONTROL DEVICES FOR LOW-VOLUME ROADS**

## **CHAPTER 5A GENERAL**

Section 5A.01	Function .....	531
Section 5A.02	Application.....	531
Section 5A.03	Design .....	531
Section 5A.04	Placement .....	533

## **CHAPTER 5B REGULATORY SIGNS**

Section 5B.01	Introduction.....	534
Section 5B.02	STOP and YIELD Signs (R1-1 and R1-2).....	534

Section 5B.03	Speed Limit Signs (R2 Series) .....	534
Section 5B.04	Traffic Movement and Prohibition Signs (R3, R4, R5, R6, R9, R10, R11, R12, R13, and R14 Series) .....	535
Section 5B.05	Parking Signs (R8 Series) .....	535
Section 5B.06	Other Regulatory Signs .....	535

## **CHAPTER 5C    WARNING SIGNS**

Section 5C.01	Introduction .....	536
Section 5C.02	Horizontal Alignment Signs (W1-1 through W1-8) .....	536
Section 5C.03	Intersection Warning Signs (W2-1 through W2-6) .....	537
Section 5C.04	Stop Ahead and Yield Ahead Signs (W3-1, W3-2) .....	537
Section 5C.05	NARROW BRIDGE Sign (W5-2) .....	537
Section 5C.06	ONE LANE BRIDGE Sign (W5-3) .....	537
Section 5C.07	Hill Sign (W7-1) .....	537
Section 5C.08	PAVEMENT ENDS Sign (W8-3) .....	537
Section 5C.09	Vehicular Traffic Warning and Non-Vehicular Warning Signs (W11 Series and W8-6) .....	537
Section 5C.10	Advisory Speed Plaque (W13-1P) .....	539
Section 5C.11	DEAD END or NO OUTLET Signs (W14-1, W14-1a, W14-2, W14-2a) .....	539
Section 5C.12	NO TRAFFIC SIGNS Sign (W18-1) .....	539
Section 5C.13	Other Warning Signs .....	539
Section 5C.14	Object Markers and Barricades .....	539

## **CHAPTER 5D    GUIDE SIGNS**

Section 5D.01	Introduction .....	540
---------------	--------------------	-----

## **CHAPTER 5E    MARKINGS**

Section 5E.01	Introduction .....	541
Section 5E.02	Center Line Markings .....	541
Section 5E.03	Edge Line Markings .....	541
Section 5E.04	Delineators .....	541
Section 5E.05	Other Markings .....	541

## **CHAPTER 5F    TRAFFIC CONTROL FOR HIGHWAY-RAIL GRADE CROSSINGS**

Section 5F.01	Introduction .....	542
Section 5F.02	Grade Crossing (Crossbuck) Sign and Number of Tracks Plaque (R15-1, R15-2P) .....	542
Section 5F.03	Grade Crossing Advance Warning Signs (W10 Series) .....	542
Section 5F.04	STOP and YIELD Signs (R1-1, R1-2) .....	543
Section 5F.05	Pavement Markings .....	543
Section 5F.06	Other Traffic Control Devices .....	543

## **CHAPTER 5G    TEMPORARY TRAFFIC CONTROL ZONES**

Section 5G.01	Introduction .....	544
Section 5G.02	Applications .....	544
Section 5G.03	Channelization Devices .....	544
Section 5G.04	Markings .....	545
Section 5G.05	Other Traffic Control Devices .....	545

## **CHAPTER 5H    TRAFFIC CONTROL FOR SCHOOL AREAS**

Section 5H.01	Introduction .....	546
---------------	--------------------	-----

## **PART 6      TEMPORARY TRAFFIC CONTROL**

### **CHAPTER 6A    GENERAL**

Section 6A.01	General .....	547
---------------	---------------	-----

### **CHAPTER 6B    FUNDAMENTAL PRINCIPLES**

Section 6B.01	Fundamental Principles of Temporary Traffic Control .....	549
---------------	---	-----

### **CHAPTER 6C    TEMPORARY TRAFFIC CONTROL ELEMENTS**

Section 6C.01	Temporary Traffic Control Plans.....	551
Section 6C.02	Temporary Traffic Control Zones .....	552
Section 6C.03	Components of Temporary Traffic Control Zones .....	552
Section 6C.04	Advance Warning Area.....	552
Section 6C.05	Transition Area.....	554
Section 6C.06	Activity Area.....	554
Section 6C.07	Termination Area .....	555
Section 6C.08	Tapers .....	555
Section 6C.09	Detours and Diversions .....	558
Section 6C.10	One-Lane, Two-Way Traffic Control.....	558
Section 6C.11	Flagger Method of One-Lane, Two-Way Traffic Control .....	558
Section 6C.12	Flag Transfer Method of One-Lane, Two-Way Traffic Control.....	558
Section 6C.13	Pilot Car Method of One-Lane, Two-Way Traffic Control.....	560
Section 6C.14	Temporary Traffic Control Signal Method of One-Lane, Two-Way Traffic Control.....	560
Section 6C.15	Stop or Yield Control Method of One-Lane, Two-Way Traffic Control.....	560

### **CHAPTER 6D    PEDESTRIAN AND WORKER SAFETY**

Section 6D.01	Pedestrian Considerations .....	561
Section 6D.02	Accessibility Considerations .....	563
Section 6D.03	Worker Safety Considerations .....	564

### **CHAPTER 6E    FLAGGER CONTROL**

Section 6E.01	Qualifications for Flaggers.....	566
Section 6E.02	High-Visibility Safety Apparel.....	566
Section 6E.03	Hand-Signaling Devices.....	566
Section 6E.04	Automated Flagger Assistance Devices .....	567
Section 6E.05	STOP/SLOW Automated Flagger Assistance Devices .....	569
Section 6E.06	Red/Yellow Lens Automated Flagger Assistance Devices .....	571
Section 6E.07	Flagger Procedures .....	573
Section 6E.08	Flagger Stations.....	575

### **CHAPTER 6F    TEMPORARY TRAFFIC CONTROL ZONE DEVICES**

Section 6F.01	Types of Devices .....	576
Section 6F.02	General Characteristics of Signs .....	576
Section 6F.03	Sign Placement .....	577
Section 6F.04	Sign Maintenance.....	583
Section 6F.05	Regulatory Sign Authority .....	583
Section 6F.06	Regulatory Sign Design .....	583
Section 6F.07	Regulatory Sign Applications .....	583
Section 6F.08	ROAD (STREET) CLOSED Sign (R11-2) .....	583
Section 6F.09	Local Traffic Only Signs (R11-3a, R11-4).....	585
Section 6F.10	Weight Limit Signs (R12-1, R12-2, R12-5) .....	585
Section 6F.11	STAY IN LANE Sign (R4-9).....	586
Section 6F.12	Work Zone and Higher Fines Signs and Plaques .....	586
Section 6F.13	PEDESTRIAN CROSSWALK Sign (R9-8) .....	586
Section 6F.14	SIDEWALK CLOSED Signs (R9-9, R9-10, R9-11, R9-11a).....	586



Section 6F.15	Special Regulatory Signs .....	587
Section 6F.16	Warning Sign Function, Design, and Application.....	587
Section 6F.17	Position of Advance Warning Signs.....	587
Section 6F.18	ROAD (STREET) WORK Sign (W20-1).....	591
Section 6F.19	DETOUR Sign (W20-2) .....	591
Section 6F.20	ROAD (STREET) CLOSED Sign (W20-3) .....	591
Section 6F.21	ONE LANE ROAD Sign (W20-4) .....	591
Section 6F.22	Lane(s) Closed Signs (W20-5, W20-5a) .....	591
Section 6F.23	CENTER LANE CLOSED AHEAD Sign (W9-3).....	592
Section 6F.24	Lane Ends Sign (W4-2) .....	592
Section 6F.25	ON RAMP Plaque (W13-4P) .....	592
Section 6F.26	RAMP NARROWS Sign (W5-4) .....	592
Section 6F.27	SLOW TRAFFIC AHEAD Sign (W23-1) .....	592
Section 6F.28	EXIT OPEN and EXIT CLOSED Signs (E5-2, E5-2a) .....	592
Section 6F.29	EXIT ONLY Sign (E5-3) .....	593
Section 6F.30	NEW TRAFFIC PATTERN AHEAD Sign (W23-2) .....	593
Section 6F.31	Flagger Signs (W20-7, W20-7a) .....	593
Section 6F.32	Two-Way Traffic Sign (W6-3) .....	593
Section 6F.33	Workers Signs (W21-1, W21-1a) .....	593
Section 6F.34	FRESH OIL (TAR) Sign (W21-2) .....	593
Section 6F.35	ROAD MACHINERY AHEAD Sign (W21-3) .....	593
Section 6F.36	Motorized Traffic Signs (W8-6, W11-10).....	594
Section 6F.37	Shoulder Work Signs (W21-5, W21-5a, W21-5b) .....	594
Section 6F.38	SURVEY CREW Sign (W21-6) .....	594
Section 6F.39	UTILITY WORK Sign (W21-7) .....	594
Section 6F.40	Signs for Blasting Areas.....	594
Section 6F.41	BLASTING ZONE AHEAD Sign (W22-1).....	595
Section 6F.42	TURN OFF 2-WAY RADIO AND CELL PHONE Sign (W22-2) .....	595
Section 6F.43	END BLASTING ZONE Sign (W22-3) .....	595
Section 6F.44	Shoulder Signs and Plaque (W8-4, W8-9, W8-17, and W8-17P) .....	595
Section 6F.45	UNEVEN LANES Sign (W8-11) .....	595
Section 6F.46	STEEL PLATE AHEAD Sign (W8-24) .....	595
Section 6F.47	NO CENTER LINE Sign (W8-12) .....	595
Section 6F.48	Reverse Curve Signs (W1-4 Series) .....	596
Section 6F.49	Double Reverse Curve Signs (W24-1 Series) .....	596
Section 6F.50	Other Warning Signs.....	596
Section 6F.51	Special Warning Signs .....	596
Section 6F.52	Advisory Speed Plaque (W13-1P) .....	596
Section 6F.53	Supplementary Distance Plaque (W7-3aP) .....	597
Section 6F.54	Motorcycle Plaque (W8-15P) .....	597
Section 6F.55	Guide Signs .....	597
Section 6F.56	ROAD WORK NEXT XX MILES Sign (G20-1) .....	597
Section 6F.57	END ROAD WORK Sign (G20-2).....	598
Section 6F.58	PILOT CAR FOLLOW ME Sign (G20-4).....	598
Section 6F.59	Detour Signs (M4-8, M4-8a, M4-8b, M4-9, M4-9a, M4-9b, M4-9c, and M4-10) .....	598
Section 6F.60	Portable Changeable Message Signs .....	598
Section 6F.61	Arrow Boards.....	601
Section 6F.62	High-Level Warning Devices (Flag Trees) .....	603
Section 6F.63	Channelizing Devices .....	604
Section 6F.64	Cones.....	606
Section 6F.65	Tubular Markers .....	606
Section 6F.66	Vertical Panels.....	607
Section 6F.67	Drums .....	607

Section 6F.68	Type 1, 2, or 3 Barricades .....	607
Section 6F.69	Direction Indicator Barricades.....	609
Section 6F.70	Temporary Traffic Barriers as Channelizing Devices.....	609
Section 6F.71	Longitudinal Channelizing Devices.....	609
Section 6F.72	Temporary Lane Separators .....	610
Section 6F.73	Other Channelizing Devices .....	610
Section 6F.74	Detectable Edging for Pedestrians .....	610
Section 6F.75	Temporary Raised Islands.....	611
Section 6F.76	Opposing Traffic Lane Divider and Sign (W6-4).....	611
Section 6F.77	Pavement Markings.....	612
Section 6F.78	Temporary Markings .....	612
Section 6F.79	Temporary Raised Pavement Markers .....	613
Section 6F.80	Delineators .....	613
Section 6F.81	Lighting Devices .....	614
Section 6F.82	Floodlights .....	614
Section 6F.83	Warning Lights .....	614
Section 6F.84	Temporary Traffic Control Signals.....	615
Section 6F.85	Temporary Traffic Barriers .....	616
Section 6F.86	Crash Cushions .....	617
Section 6F.87	Rumble Strips.....	618
Section 6F.88	Screens .....	618

## **CHAPTER 6G TYPE OF TEMPORARY TRAFFIC CONTROL ZONE ACTIVITIES**

Section 6G.01	Typical Applications.....	619
Section 6G.02	Work Duration.....	619
Section 6G.03	Location of Work .....	621
Section 6G.04	Modifications To Fulfill Special Needs.....	621
Section 6G.05	Work Affecting Pedestrian and Bicycle Facilities.....	622
Section 6G.06	Work Outside of the Shoulder .....	622
Section 6G.07	Work on the Shoulder with No Encroachment.....	623
Section 6G.08	Work on the Shoulder with Minor Encroachment.....	624
Section 6G.09	Work Within the Median .....	624
Section 6G.10	Work Within the Traveled Way of a Two-Lane Highway .....	624
Section 6G.11	Work Within the Traveled Way of an Urban Street.....	625
Section 6G.12	Work Within the Traveled Way of a Multi-Lane, Non-Access Controlled Highway .....	625
Section 6G.13	Work Within the Traveled Way at an Intersection .....	626
Section 6G.14	Work Within the Traveled Way of a Freeway or Expressway .....	627
Section 6G.15	Two-Lane, Two-Way Traffic on One Roadway of a Normally Divided Highway.....	628
Section 6G.16	Crossovers .....	628
Section 6G.17	Interchanges .....	628
Section 6G.18	Work in the Vicinity of a Grade Crossing.....	629
Section 6G.19	Temporary Traffic Control During Nighttime Hours.....	629

## **CHAPTER 6H TYPICAL APPLICATIONS**

Section 6H.01	Typical Applications.....	631
---------------	---------------------------	-----

## **CHAPTER 6I CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS**

Section 6I.01	General .....	726
Section 6I.02	Major Traffic Incidents.....	727
Section 6I.03	Intermediate Traffic Incidents.....	728
Section 6I.04	Minor Traffic Incidents .....	728
Section 6I.05	Use of Emergency-Vehicle Lighting.....	729



## **PART 7      TRAFFIC CONTROL FOR SCHOOL AREAS**

### **CHAPTER 7A    GENERAL**

Section 7A.01	Need for Standards.....	731
Section 7A.02	School Routes and Established School Crossings .....	731
Section 7A.03	School Crossing Control Criteria .....	731
Section 7A.04	Scope.....	732

### **CHAPTER 7B    SIGNS**

Section 7B.01	Size of School Signs.....	733
Section 7B.02	Illumination and Reflectorization.....	734
Section 7B.03	Position of Signs.....	734
Section 7B.04	Height of Signs.....	734
Section 7B.05	Installation of Signs.....	734
Section 7B.06	Lettering.....	734
Section 7B.07	Sign Color for School Warning Signs .....	734
Section 7B.08	School Sign (S1-1) and Plaques .....	734
Section 7B.09	School Zone Sign (S1-1) and Plaques (S4-3P, S4-7P) and END SCHOOL ZONE Sign (S5-2).....	736
Section 7B.10	Higher Fines Zone Signs (R2-10, R2-11) and Plaques .....	736
Section 7B.11	School Advance Crossing Assembly.....	736
Section 7B.12	School Crossing Assembly.....	741
Section 7B.13	School Bus Stop Ahead Sign (S3-1) .....	742
Section 7B.14	SCHOOL BUS TURN AHEAD Sign (S3-2).....	742
Section 7B.15	School Speed Limit Assembly (S4-1P, S4-2P, S4-3P, S4-4P, S4-6P, S5-1) and END SCHOOL SPEED LIMIT Sign (S5-3) .....	742
Section 7B.16	Reduced School Speed Limit Ahead Sign (S4-5, S4-5a).....	743
Section 7B.17	Parking and Stopping Signs (R7 and R8 Series) .....	743

### **CHAPTER 7C    MARKINGS**

Section 7C.01	Functions and Limitations.....	744
Section 7C.02	Crosswalk Markings .....	744
Section 7C.03	Pavement Word, Symbol, and Arrow Markings.....	744

### **CHAPTER 7D    CROSSING SUPERVISION**

Section 7D.01	Types of Crossing Supervision.....	745
Section 7D.02	Adult Crossing Guards.....	745
Section 7D.03	Qualifications of Adult Crossing Guards .....	745
Section 7D.04	Uniform of Adult Crossing Guards.....	745
Section 7D.05	Operating Procedures for Adult Crossing Guards .....	745

## **PART 8      TRAFFIC CONTROL FOR RAILROAD AND LIGHT RAIL TRANSIT GRADE CROSSINGS**

### **CHAPTER 8A    GENERAL**

Section 8A.01	Introduction.....	747
Section 8A.02	Use of Standard Devices, Systems, and Practices at Highway-Rail Grade Crossings .....	747
Section 8A.03	Use of Standard Devices, Systems, and Practices at Highway-LRT Grade Crossings.....	748
Section 8A.04	Uniform Provisions .....	749
Section 8A.05	Grade Crossing Elimination.....	749
Section 8A.06	Illumination at Grade Crossings .....	750
Section 8A.07	Quiet Zone Treatments at Highway-Rail Grade Crossings .....	750
Section 8A.08	Temporary Traffic Control Zones .....	750

**CHAPTER 8B SIGNS AND MARKINGS**

Section 8B.01	Purpose .....	751
Section 8B.02	Sizes of Grade Crossing Signs .....	751
Section 8B.03	Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Plaque (R15-2P) at Active and Passive Grade Crossings .....	751
Section 8B.04	Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings.....	754
Section 8B.05	Use of STOP (R1-1) or YIELD (R1-2) Signs without Crossbuck Signs at Highway-LRT Grade Crossings .....	758
Section 8B.06	Grade Crossing Advance Warning Signs (W10 Series) .....	758
Section 8B.07	EXEMPT Grade Crossing Plaques (R15-3P, W10-1aP).....	759
Section 8B.08	Turn Restrictions During Preemption .....	760
Section 8B.09	DO NOT STOP ON TRACKS Sign (R8-8).....	760
Section 8B.10	TRACKS OUT OF SERVICE Sign (R8-9).....	760
Section 8B.11	STOP HERE WHEN FLASHING Signs (R8-10, R8-10a) .....	761
Section 8B.12	STOP HERE ON RED Signs (R10-6, R10-6a).....	761
Section 8B.13	Light Rail Transit Only Lane Signs (R15-4 Series) .....	761
Section 8B.14	Do Not Pass Light Rail Transit Signs (R15-5, R15-5a) .....	761
Section 8B.15	No Motor Vehicles On Tracks Signs (R15-6, R15-6a) .....	762
Section 8B.16	Divided Highway with Light Rail Transit Crossing Signs (R15-7 Series).....	762
Section 8B.17	LOOK Sign (R15-8).....	762
Section 8B.18	Emergency Notification Sign (I-13).....	762
Section 8B.19	Light Rail Transit Approaching-Activated Blank-Out Warning Sign (W10-7).....	763
Section 8B.20	TRAINS MAY EXCEED 80 MPH Sign (W10-8) .....	763
Section 8B.21	NO TRAIN HORN Sign or Plaque (W10-9, W10-9P) .....	763
Section 8B.22	NO GATES OR LIGHTS Plaque (W10-13P) .....	763
Section 8B.23	Low Ground Clearance Grade Crossing Sign (W10-5) .....	763
Section 8B.24	Storage Space Signs (W10-11, W10-11a, W10-11b).....	764
Section 8B.25	Skewed Crossing Sign (W10-12).....	764
Section 8B.26	Light Rail Transit Station Sign (I-12) .....	764
Section 8B.27	Pavement Markings.....	764
Section 8B.28	Stop and Yield Lines .....	766
Section 8B.29	Dynamic Envelope Markings.....	767

**CHAPTER 8C FLASHING-LIGHT SIGNALS, GATES, AND TRAFFIC CONTROL SIGNALS**

Section 8C.01	Introduction .....	769
Section 8C.02	Flashing-Light Signals .....	769
Section 8C.03	Flashing-Light Signals at Highway-LRT Grade Crossings .....	772
Section 8C.04	Automatic Gates .....	772
Section 8C.05	Use of Automatic Gates at LRT Grade Crossings.....	773
Section 8C.06	Four-Quadrant Gate Systems .....	773
Section 8C.07	Wayside Horn Systems.....	775
Section 8C.08	Rail Traffic Detection.....	775
Section 8C.09	Traffic Control Signals at or Near Highway-Rail Grade Crossings .....	776
Section 8C.10	Traffic Control Signals at or Near Highway-LRT Grade Crossings.....	777
Section 8C.11	Use of Traffic Control Signals for Control of LRT Vehicles at Grade Crossings.....	778
Section 8C.12	Grade Crossings Within or In Close Proximity to Circular Intersections.....	780
Section 8C.13	Pedestrian and Bicycle Signals and Crossings at LRT Grade Crossings.....	780

**CHAPTER 8D PATHWAY GRADE CROSSINGS**

Section 8D.01	Purpose .....	786
Section 8D.02	Use of Standard Devices, Systems, and Practices.....	786
Section 8D.03	Pathway Grade Crossing Signs and Markings .....	786
Section 8D.04	Stop Lines, Edge Lines, and Detectable Warnings .....	786
Section 8D.05	Passive Devices for Pathway Grade Crossings.....	787
Section 8D.06	Active Traffic Control Systems for Pathway Grade Crossings .....	788

## **PART 9      TRAFFIC CONTROL FOR BICYCLE FACILITIES**

### **CHAPTER 9A    GENERAL**

Section 9A.01	Requirements for Bicyclist Traffic Control Devices.....	789
Section 9A.02	Scope.....	789
Section 9A.03	Definitions Relating to Bicycles .....	789
Section 9A.04	Maintenance.....	789
Section 9A.05	Relation to Other Documents.....	789
Section 9A.06	Placement Authority.....	789
Section 9A.07	Meaning of Standard, Guidance, Option, and Support.....	789
Section 9A.08	Colors .....	789

### **CHAPTER 9B    SIGNS**

Section 9B.01	Application and Placement of Signs.....	790
Section 9B.02	Design of Bicycle Signs.....	790
Section 9B.03	STOP and YIELD Signs (R1-1, R1-2).....	792
Section 9B.04	Bike Lane Signs and Plaques (R3-17, R3-17aP, R3-17bP).....	794
Section 9B.05	BEGIN RIGHT TURN LANE YIELD TO BIKES Sign (R4-4) .....	794
Section 9B.06	Bicycles May Use Full Lane Sign (R4-11) .....	794
Section 9B.07	Bicycle WRONG WAY Sign and RIDE WITH TRAFFIC Plaque (R5-1b, R9-3cP).....	794
Section 9B.08	NO MOTOR VEHICLES Sign (R5-3) .....	795
Section 9B.09	Selective Exclusion Signs.....	795
Section 9B.10	No Parking Bike Lane Signs (R7-9, R7-9a) .....	795
Section 9B.11	Bicycle Regulatory Signs (R9-5, R9-6, R10-4, R10-24, R10-25, and R10-26) .....	795
Section 9B.12	Shared-Use Path Restriction Sign (R9-7) .....	795
Section 9B.13	Bicycle Signal Actuation Sign (R10-22).....	796
Section 9B.14	Other Regulatory Signs.....	796
Section 9B.15	Turn or Curve Warning Signs (W1 Series) .....	796
Section 9B.16	Intersection Warning Signs (W2 Series) .....	796
Section 9B.17	Bicycle Surface Condition Warning Sign (W8-10) .....	796
Section 9B.18	Bicycle Warning and Combined Bicycle/Pedestrian Signs (W11-1 and W11-15) .....	796
Section 9B.19	Other Bicycle Warning Signs.....	798
Section 9B.20	Bicycle Guide Signs (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c, D11-1, D11-1c).....	798
Section 9B.21	Bicycle Route Signs (M1-8, M1-8a, M1-9).....	800
Section 9B.22	Bicycle Route Sign Auxiliary Plaques .....	802
Section 9B.23	Bicycle Parking Area Sign (D4-3).....	804
Section 9B.24	Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a) .....	804
Section 9B.25	Mode-Specific Guide Signs for Shared-Use Paths (D11-1a, D11-2, D11-3, D11-4).....	805
Section 9B.26	Object Markers.....	805

### **CHAPTER 9C    MARKINGS**

Section 9C.01	Functions of Markings .....	806
Section 9C.02	General Principles.....	806
Section 9C.03	Marking Patterns and Colors on Shared-Use Paths .....	806
Section 9C.04	Markings For Bicycle Lanes .....	806
Section 9C.05	Bicycle Detector Symbol.....	810
Section 9C.06	Pavement Markings for Obstructions.....	810
Section 9C.07	Shared Lane Marking .....	810

### **CHAPTER 9D    SIGNALS**

Section 9D.01	Application.....	816
Section 9D.02	Signal Operations for Bicycles .....	816

<b>APPENDIX A1. CONGRESSIONAL LEGISLATION .....</b>	<b>A1-1</b>
<b>APPENDIX A2. METRIC CONVERSIONS.....</b>	<b>A2-1</b>

## FIGURES

### Page

Figure 1A-1	Process for Requesting and Conducting Experimentations for New Traffic Control Devices ...	5
Figure 1A-2	Process for Incorporating New Traffic Control Devices into the MUTCD .....	8
Figure 2A-1	Examples of Enhanced Conspicuity for Signs .....	37
Figure 2A-2	Examples of Heights and Lateral Locations of Sign Installations .....	38
Figure 2A-3	Examples of Locations for Some Typical Signs at Intersections.....	39
Figure 2A-4	Relative Locations of Regulatory, Warning, and Guide Signs on an Intersection Approach...	40
Figure 2B-1	STOP and YIELD Signs and Plaques .....	51
Figure 2B-2	Unsignalized Pedestrian Crosswalk Signs .....	55
Figure 2B-3	Speed Limit and Photo Enforcement Signs and Plaques.....	57
Figure 2B-4	Movement Prohibition and Lane Control Signs and Plaques .....	60
Figure 2B-5	Intersection Lane Control Sign Arrow Options for Roundabouts.....	62
Figure 2B-6	Center and Reversible Lane Control Signs and Plaques.....	65
Figure 2B-7	Location of Reversible Two-Way Left-Turn Signs.....	66
Figure 2B-8	Jughandle Regulatory Signs .....	68
Figure 2B-9	Examples of Applications of Jughandle Regulatory and Guide Signing.....	69
Figure 2B-10	Passing, Keep Right, and Slow Traffic Signs .....	72
Figure 2B-11	Selective Exclusion Signs .....	75
Figure 2B-12	Locations of Wrong-Way Signing for Divided Highways with Median Widths of 30 Feet or Wider .....	76
Figure 2B-13	ONE WAY and Divided Highway Crossing Signs .....	78
Figure 2B-14	Locations of ONE WAY Signs.....	79
Figure 2B-15	ONE WAY Signing for Divided Highways with Median Widths of 30 Feet or Wider .....	80
Figure 2B-16	ONE WAY Signing for Divided Highways with Median Widths Narrower Than 30 Feet .....	81
Figure 2B-17	ONE WAY Signing for Divided Highways with Median Widths Narrower Than 30 Feet and Separated Left-Turn Lanes .....	82
Figure 2B-18	Example of Application of Regulatory Signing and Pavement Markings at an Exit Ramp Termination to Deter Wrong-Way Entry .....	83
Figure 2B-19	Example of Application of Regulatory Signing and Pavement Markings at an Entrance Ramp Terminal Where the Design Does Not Clearly Indicate the Direction of Flow .....	83
Figure 2B-20	Roundabout Signs and Plaques .....	84
Figure 2B-21	Example of Regulatory and Warning Signs for a Mini-Roundabout .....	85
Figure 2B-22	Example of Regulatory and Warning Signs for a One-Lane Roundabout .....	86
Figure 2B-23	Example of Regulatory and Warning Signs for a Two-Lane Roundabout with Consecutive Double Lefts .....	87
Figure 2B-24	Parking and Standing Signs and Plaques (R7 Series) .....	88
Figure 2B-25	Parking and Stopping Signs and Plaques (R8 Series) .....	90
Figure 2B-26	Pedestrian Signs and Plaques .....	93
Figure 2B-27	Traffic Signal Signs and Plaques .....	96
Figure 2B-28	Ramp Metering Signs.....	97
Figure 2B-29	Road Closed and Weight Limit Signs .....	98
Figure 2B-30	Truck Signs .....	99
Figure 2B-31	Headlight Use Signs .....	100
Figure 2B-32	Other Regulatory Signs and Symbols .....	101
Figure 2C-1	Horizontal Alignment Signs and Plaques .....	109
Figure 2C-2	Example of Warning Signs for a Turn.....	111
Figure 2C-3	Example of Advisory Speed Signing for an Exit Ramp.....	116
Figure 2C-4	Vertical Grade Signs and Plaques .....	117
Figure 2C-5	Miscellaneous Warning Signs .....	118

Figure 2C-6	Roadway and Weather Condition and Advance Traffic Control Signs and Plaques.....	121
Figure 2C-7	Reduced Speed Limit Ahead Signs.....	124
Figure 2C-8	Merging and Passing Signs and Plaques .....	125
Figure 2C-9	Intersection Warning Signs and Plaques .....	127
Figure 2C-10	Vehicular Traffic Warning Signs and Plaques.....	129
Figure 2C-11	Non-Vehicular Warning Signs.....	130
Figure 2C-12	Supplemental Warning Plaques.....	132
Figure 2C-13	Object Markers.....	135
Figure 2D-1	Examples of Color-Coded Destination Guide Signs .....	138
Figure 2D-2	Arrows for Use on Guide Signs.....	141
Figure 2D-3	Route Signs .....	143
Figure 2D-4	Route Sign Auxiliaries .....	145
Figure 2D-5	Advance Turn and Directional Arrow Auxiliary Signs .....	147
Figure 2D-6	Illustration of Directional Assemblies and Other Route Signs (for One Direction of Travel Only).....	149
Figure 2D-7	Destination and Distance Signs.....	155
Figure 2D-8	Destination Signs for Roundabouts.....	158
Figure 2D-9	Examples of Guide Signs for Roundabouts.....	159
Figure 2D-10	Street Name and Parking Signs.....	162
Figure 2D-11	Example of Interchange Crossroad Signing for a One-Lane Approach .....	165
Figure 2D-12	Example of Minor Interchange Crossroad Signing.....	166
Figure 2D-13	Examples of Multi-Lane Crossroad Signing for a Diamond Interchange .....	167
Figure 2D-14	Examples of Multi-Lane Crossroad Signing for a Partial Cloverleaf Interchange .....	168
Figure 2D-15	Examples of Multi-Lane Crossroad Signing for a Cloverleaf Interchange.....	169
Figure 2D-16	Example of Crossroad Signing for an Entrance Ramp with a Nearby Frontage Road.....	170
Figure 2D-17	Example of Weigh Station Signing .....	173
Figure 2D-18	Examples of Community Wayfinding Guide Signs.....	174
Figure 2D-19	Example of a Community Wayfinding Guide Sign System Showing Direction from a Freeway or Expressway .....	175
Figure 2D-20	Example of a Color-Coded Community Wayfinding Guide Sign System.....	176
Figure 2D-21	Crossover, Truck Lane, and Slow Vehicle Signs .....	178
Figure 2D-22	Examples of Use of the National Scenic Byways Sign .....	180
Figure 2E-1	Example of Guide Sign Spreading .....	184
Figure 2E-2	Pull-Through Signs .....	184
Figure 2E-3	Overhead Arrow-per-Lane Guide Sign for a Multi-Lane Exit with an Option Lane .....	194
Figure 2E-4	Overhead Arrow-per-Lane Guide Signs for a Two-Lane Exit to the Right with an Option Lane .....	195
Figure 2E-5	Overhead Arrow-per-Lane Guide Signs for a Two-Lane Exit to the Right with an Option Lane (Through Lanes Curve to the Left) .....	196
Figure 2E-6	Overhead Arrow-per-Lane Guide Signs for a Split with an Option Lane .....	197
Figure 2E-7	Diagrammatic Guide Sign for a Multi-Lane Exit with an Option Lane.....	199
Figure 2E-8	Diagrammatic Guide Signs for a Two-Lane Exit to the Right with an Option Lane .....	200
Figure 2E-9	Diagrammatic Guide Signs for a Two-Lane Exit to the Right with an Option Lane (Through Lanes Curve to the Left).....	201
Figure 2E-10	Diagrammatic Guide Signs for a Split with an Option Lane .....	202
Figure 2E-11	Example of Signing for a Two-Lane Intermediate or Minor Interchange Exit with an Option Lane and a Dropped Lane.....	204
Figure 2E-12	Example of Signing for a Two-Lane Intermediate or Minor Interchange Exit with Option and Auxiliary Lanes.....	205
Figure 2E-13	EXIT ONLY and LEFT Sign Panels.....	206
Figure 2E-14	Guide Signs for a Split with Dedicated Lanes.....	207
Figure 2E-15	Guide Signs for a Single-Lane Exit to the Left with a Dropped Lane .....	208
Figure 2E-16	Guide Signs for a Single-Lane Exit to the Right with a Dropped Lane .....	209
Figure 2E-17	Interstate, Off-Interstate, and U.S. Route Signs .....	210



Figure 2E-18	Eisenhower Interstate System Signs.....	211
Figure 2E-19	Example of Interchange Numbering for Mainline and Circumferential Routes .....	213
Figure 2E-20	Example of Interchange Numbering for Mainline, Loop, and Spur Routes.....	214
Figure 2E-21	Example of Interchange Numbering for Overlapping Routes .....	215
Figure 2E-22	Examples of Interchange Advance Guide Signs, Exit Number Plaques, and LEFT Plaque ...	217
Figure 2E-23	Next Exit Plaques .....	218
Figure 2E-24	Supplemental Guide Sign for a Multi-Exit Interchange .....	219
Figure 2E-25	Supplemental Guide Sign for a Park – Ride Facility.....	219
Figure 2E-26	Examples of Interchange Exit Direction Signs .....	220
Figure 2E-27	Interchange Exit Direction Sign with an Advisory Speed Panel.....	221
Figure 2E-28	Exit Gore Signs .....	222
Figure 2E-29	Post-Interchange Distance Sign.....	223
Figure 2E-30	Example of Using an Interchange Sequence Sign for Closely-Spaced Interchanges .....	224
Figure 2E-31	Interchange Sequence Sign .....	225
Figure 2E-32	Community Interchanges Identification Sign.....	225
Figure 2E-33	NEXT EXITS Sign.....	225
Figure 2E-34	Examples of Guide Signs for a Freeway-to-Freeway Interchange.....	227
Figure 2E-35	Examples of Guide Signs for a Full Cloverleaf Interchange .....	229
Figure 2E-36	Examples of Guide Signs for a Full Cloverleaf Interchange with Collector-Distributor Roadways .....	231
Figure 2E-37	Examples of Guide Signs for a Partial Cloverleaf Interchange .....	232
Figure 2E-38	Examples of Guide Signs for a Diamond Interchange .....	233
Figure 2E-39	Examples of Guide Signs for a Diamond Interchange in an Urban Area.....	235
Figure 2E-40	Examples of Guide Signs for a Minor Interchange .....	236
Figure 2F-1	Examples of ETC Account Pictographs and Use of Purple Backgrounds and Underlay Panels .....	239
Figure 2F-2	Toll Plaza Regulatory Signs and Plaques .....	240
Figure 2F-3	Toll Plaza Warning Signs and Plaques .....	241
Figure 2F-4	ETC Account-Only Auxiliary Signs for Use in Route Sign Assemblies .....	243
Figure 2F-5	Examples of Guide Signs for Entrances to Toll Highways or Ramps .....	245
Figure 2F-6	Examples of Guide Signs for the Entrance to a Toll Highway on which Tolls are Collected Electronically Only .....	246
Figure 2F-7	Examples of Guide Signs for Alternative Toll and Non-Toll Ramp Connections to a Non-Toll Highway .....	247
Figure 2F-8	Examples of Conventional Toll Plaza Advance Signs .....	248
Figure 2F-9	Examples of Toll Plaza Canopy Signs.....	248
Figure 2F-10	Examples of Mainline Toll Plaza Approach and Canopy Signing .....	250
Figure 2F-11	Examples of Guide Signs for a Mainline Toll Plaza on a Diverging Alignment from Open-Road ETC Lanes .....	251
Figure 2G-1	Preferential Lane Regulatory Signs and Plaques .....	255
Figure 2G-2	Example of Signing for an Added Continuous-Access Contiguous or Buffer-Separated HOV Lane .....	261
Figure 2G-3	Example of Signing for a General-Purpose Lane that Becomes a Continuous-Access Contiguous or Buffer-Separated HOV Lane .....	262
Figure 2G-4	Examples of Warning Signs and Plaques Applicable Only to Preferential Lanes.....	264
Figure 2G-5	Example of an Overhead Advance Guide Sign for a Preferential Lane Entrance .....	267
Figure 2G-6	Examples of Overhead or Post-Mounted Preferential Lane Entrance Direction Signs .....	267
Figure 2G-7	Entrance Gore Signs for Barrier-Separated Preferential Lanes.....	268
Figure 2G-8	Example of Signing for an Entrance to Access-Restricted HOV Lanes .....	269
Figure 2G-9	Example of Signing for an Intermediate Entry to a Barrier- or Buffer-Separated HOV Lane .....	271
Figure 2G-10	Example of Signing for the Intermediate Entry to, Egress from, and End of Access- Restricted HOV Lanes .....	272

Figure 2G-11	Examples of Barrier-Mounted Guide Signs for an Intermediate Egress from Preferential Lanes .....	273
Figure 2G-12	Examples of Guide Signs for an Intermediate Egress from a Barrier- or Buffer-Separated HOV Lane .....	274
Figure 2G-13	Example of Signing for a Direct Entrance Ramp to an HOV Lane from a Park-and-Ride Facility and a Local Street .....	275
Figure 2G-14	Exit Gore Sign for a Direct Exit from a Preferential Lane.....	276
Figure 2G-15	Examples of Guide Signs for Direct HOV Lane Entrance and Exit Ramps .....	277
Figure 2G-16	Examples of Guide Signs for a Direct Access Ramp between HOV Lanes on Separate Freeways.....	278
Figure 2G-17	Regulatory Signs for Managed Lanes .....	280
Figure 2G-18	Examples of Guide Signs for Entrances to Priced Managed Lanes .....	281
Figure 2G-19	Example of an Exit Destinations Sign for a Managed Lane .....	282
Figure 2G-20	Example of a Comparative Travel Time Information Sign for Preferential or Managed Lanes .....	282
Figure 2G-21	Example of Signing for the Entrance to an Access-Restricted Priced Managed Lane .....	283
Figure 2G-22	Example of Signing for the Entrance to an Access-Restricted Priced Managed Lane Where a General-Purpose Lane Becomes the Managed Lane.....	284
Figure 2G-23	Example of Signing for an Intermediate Entry to a Barrier- or Buffer-Separated Priced Managed Lane.....	285
Figure 2G-24	Example of Signing for the Intermediate Entry to, Egress from, and End of Access-Restricted Priced Managed Lanes.....	286
Figure 2G-25	Examples of Guide Signs for an Intermediate Egress from a Barrier- or Buffer-Separated HOV Lane .....	287
Figure 2G-26	Examples of Guide Signs for Direct Managed Lane Entrance and Exit Ramps .....	288
Figure 2G-27	Examples of Guide Signs for a Direct Access Ramp between Managed Lanes on Separate Freeways.....	289
Figure 2G-28	Examples of Guide Signs for a Direct Entrance Ramp to a Priced Managed Lane and Trailblazing to a Nearby Entrance to the General-Purpose Lanes.....	290
Figure 2G-29	Examples of Guide Signs for Separate Entrance Ramps to General-Purpose and Priced Managed Lanes from the Same Crossroad .....	291
Figure 2H-1	General Information and Miscellaneous Information Signs .....	293
Figure 2H-2	Reference Location Signs.....	295
Figure 2H-3	Intermediate Reference Location Signs .....	295
Figure 2H-4	Enhanced Reference Location Signs.....	296
Figure 2H-5	Examples of Acknowledgment Sign Designs.....	298
Figure 2I-1	General Service Signs and Plaques.....	301
Figure 2I-2	Example of Next Services Plaque .....	302
Figure 2I-3	Examples of General Service Signs with and without Exit Numbering.....	304
Figure 2I-4	Examples of Interstate Oasis Signs and Plaques .....	306
Figure 2I-5	Rest Area and Other Roadside Area Signs.....	307
Figure 2I-6	Brake Check Area and Chain-Up Area Signs .....	308
Figure 2I-7	Examples of Tourist Information and Welcome Center Signs .....	309
Figure 2I-8	Radio, Telephone, and Carpool Information Signs .....	310
Figure 2J-1	Examples of Specific Service Signs .....	314
Figure 2J-2	Examples of Specific Service Sign Locations .....	315
Figure 2J-3	Examples of Supplemental Messages on Logo Sign Panels.....	316
Figure 2J-4	Examples of RV Access Supplemental Messages on Logo Sign Panels .....	316
Figure 2J-5	Examples of Specific Service Trailblazer Signs.....	319
Figure 2K-1	Examples of Tourist-Oriented Directional Signs .....	321
Figure 2K-2	Examples of Intersection Approach Signs and Advance Signs for Tourist-Oriented Directional Signs.....	322
Figure 2M-1	Examples of Use of Arrows, Educational Plaques, and Prohibitory Slashes .....	333



Figure 2M-2	Examples of Recreational and Cultural Interest Area Guide Signs .....	334
Figure 2M-3	Arrangement, Height, and Lateral Position of Signs Located Within Recreational and Cultural Interest Areas .....	335
Figure 2M-4	Examples of Symbol and Destination Guide Signing Layout .....	336
Figure 2M-5	Recreational and Cultural Interest Area Symbol Signs for General Applications .....	337
Figure 2M-6	Recreational and Cultural Interest Area Symbol Signs for Accommodations .....	338
Figure 2M-7	Recreational and Cultural Interest Area Symbol Signs for Services.....	338
Figure 2M-8	Recreational and Cultural Interest Area Symbol Signs for Land Recreation.....	339
Figure 2M-9	Recreational and Cultural Interest Area Symbol Signs for Water Recreation .....	340
Figure 2M-10	Recreational and Cultural Interest Area Symbol Signs for Winter Recreation .....	341
Figure 2N-1	Emergency Management Signs .....	343
Figure 3B-1	Examples of Two-Lane, Two-Way Marking Applications .....	350
Figure 3B-2	Examples of Four-or-More Lane, Two-Way Marking Applications .....	351
Figure 3B-3	Examples of Three-Lane, Two-Way Marking Applications.....	352
Figure 3B-4	Method of Locating and Determining the Limits of No-Passing Zones at Curves .....	353
Figure 3B-5	Example of Application of Three-Lane, Two-Way Marking for Changing Direction of the Center Lane .....	355
Figure 3B-6	Example of Reversible Lane Marking Application .....	356
Figure 3B-7	Example of Two-Way Left-Turn Lane Marking Applications.....	357
Figure 3B-8	Examples of Dotted Line and Channelizing Line Applications for Exit Ramp Markings....	358
Figure 3B-9	Examples of Dotted Line and Channelizing Line Applications for Entrance Ramp Markings .....	360
Figure 3B-10	Examples of Applications of Freeway and Expressway Lane-Drop Markings .....	363
Figure 3B-11	Examples of Applications of Conventional Road Lane-Drop Markings .....	368
Figure 3B-12	Example of Solid Double White Lines Used to Prohibit Lane Changing .....	370
Figure 3B-13	Examples of Line Extensions through Intersections .....	372
Figure 3B-14	Examples of Applications of Lane-Reduction Transition Markings .....	375
Figure 3B-15	Examples of Applications of Markings for Obstructions in the Roadway .....	377
Figure 3B-16	Recommended Yield Line Layouts .....	382
Figure 3B-17	Examples of Yield Lines at Unsignalized Midblock Crosswalks.....	383
Figure 3B-18	Do Not Block Intersection Markings .....	384
Figure 3B-19	Examples of Crosswalk Markings.....	384
Figure 3B-20	Example of Crosswalk Markings for an Exclusive Pedestrian Phase that Permits Diagonal Crossing .....	385
Figure 3B-21	Examples of Parking Space Markings .....	386
Figure 3B-22	International Symbol of Accessibility Parking Space Marking .....	387
Figure 3B-23	Example of Elongated Letters for Word Pavement Markings .....	387
Figure 3B-24	Examples of Standard Arrows for Pavement Markings .....	388
Figure 3B-25	Examples of Elongated Route Shields for Pavement Markings .....	390
Figure 3B-26	Yield Ahead Triangle Symbols .....	391
Figure 3B-27	Examples of Lane-Use Control Word and Arrow Pavement Markings .....	392
Figure 3B-28	Example of the Application of Speed Reduction Markings.....	394
Figure 3B-29	Pavement Markings for Speed Humps without Crosswalks.....	396
Figure 3B-30	Pavement Markings for Speed Tables or Speed Humps with Crosswalks .....	397
Figure 3B-31	Advance Warning Markings for Speed Humps .....	398
Figure 3C-1	Example of Markings for Approach and Circulatory Roadways at a Roundabout .....	399
Figure 3C-2	Lane-Use Arrow Pavement Marking Options for Roundabout Approaches .....	400
Figure 3C-3	Example of Markings for a One-Lane Roundabout .....	400
Figure 3C-4	Example of Markings for a Two-Lane Roundabout with One- and Two-Lane Approaches...	401
Figure 3C-5	Example of Markings for a Two-Lane Roundabout with One-Lane Exits.....	403
Figure 3C-6	Example of Markings for a Two-Lane Roundabout with Two-Lane Exits.....	404
Figure 3C-7	Example of Markings for a Two-Lane Roundabout with a Double Left Turn .....	405
Figure 3C-8	Example of Markings for a Two-Lane Roundabout with a Double Right Turn .....	406
Figure 3C-9	Example of Markings for a Two-Lane Roundabout with Consecutive Double Lefts.....	407

Figure 3C-10	Example of Markings for a Three-Lane Roundabout with Two- and Three-Lane Approaches.....	408
Figure 3C-11	Example of Markings for a Three-Lane Roundabout with Three-Lane Approaches .....	409
Figure 3C-12	Example of Markings for a Three-Lane Roundabout with Two-Lane Exits .....	410
Figure 3C-13	Example of Markings for Two Linked Roundabouts .....	411
Figure 3C-14	Example of Markings for a Diamond Interchange with Two Circular-Shaped Roundabout Ramp Terminals.....	412
Figure 3D-1	Markings for Barrier-Separated Preferential Lanes .....	418
Figure 3D-2	Markings for Buffer-Separated Preferential Lanes .....	418
Figure 3D-3	Markings for Contiguous Preferential Lanes .....	420
Figure 3D-4	Markings for Counter-Flow Preferential Lanes on Divided Highways .....	422
Figure 3F-1	Examples of Delineator Placement .....	425
Figure 3J-1	Examples of Longitudinal Rumble Strip Markings .....	432
Figure 4C-1	Warrant 2, Four-Hour Vehicular Volume.....	440
Figure 4C-2	Warrant 2, Four-Hour Vehicular Volume (70% Factor) .....	440
Figure 4C-3	Warrant 3, Peak Hour.....	441
Figure 4C-4	Warrant 3, Peak Hour (70% Factor).....	441
Figure 4C-5	Warrant 4, Pedestrian Four-Hour Volume.....	443
Figure 4C-6	Warrant 4, Pedestrian Four-Hour Volume (70% Factor) .....	443
Figure 4C-7	Warrant 4, Pedestrian Peak Hour.....	444
Figure 4C-8	Warrant 4, Pedestrian Peak Hour (70% Factor) .....	444
Figure 4C-9	Warrant 9, Intersection Near a Grade Crossing (One Approach Lane at the Track Crossing) .....	447
Figure 4C-10	Warrant 9, Intersection Near a Grade Crossing (Two or More Approach Lanes at the Track Crossing) .....	447
Figure 4D-1	Example of U-Turn Signal Face .....	456
Figure 4D-2	Typical Arrangements of Signal Sections in Signal Faces That Do Not Control Turning Movements .....	458
Figure 4D-3	Recommended Vehicular Signal Faces for Approaches with Posted, Statutory, or 85 <sup>th</sup> -Percentile Speed of 45 mph or Higher .....	460
Figure 4D-4	Lateral and Longitudinal Location of Primary Signal Faces.....	463
Figure 4D-5	Maximum Mounting Height of Signal Faces Located Between 40 Feet and 53 Feet from Stop Line .....	465
Figure 4D-6	Typical Position and Arrangements of Shared Signal Faces for Permissive Only Mode Left Turns.....	467
Figure 4D-7	Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Permissive Only Mode Left Turns .....	468
Figure 4D-8	Typical Position and Arrangements of Separate Signal Faces with Flashing Red Arrow for Permissive Only Mode and Protected/Permissive Mode Left Turns.....	469
Figure 4D-9	Typical Positions and Arrangements of Shared Signal Faces for Protected Only Mode Left Turns.....	470
Figure 4D-10	Typical Position and Arrangements of Separate Signal Faces for Protected Only Mode Left Turns.....	471
Figure 4D-11	Typical Position and Arrangements of Shared Signal Faces for Protected/Permissive Mode Left Turns .....	472
Figure 4D-12	Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Protected/Permissive Mode and Protected Only Mode Left Turns .....	473
Figure 4D-13	Typical Positions and Arrangements of Shared Signal Faces for Permissive Only Mode Right Turns .....	476
Figure 4D-14	Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Permissive Only Mode Right Turns .....	477
Figure 4D-15	Typical Position and Arrangements of Separate Signal Faces with Flashing Red Arrow for Permissive Only Mode and Protected/Permissive Mode Right Turns .....	478

Figure 4D-16	Typical Positions and Arrangements of Shared Signal Faces for Protected Only Mode Right Turns .....	479
Figure 4D-17	Typical Position and Arrangements of Separate Signal Faces for Protected Only Mode Right Turns.....	480
Figure 4D-18	Typical Positions and Arrangements of Shared Signal Faces for Protected/Permissive Mode Right Turns .....	481
Figure 4D-19	Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Protected/Permissive Mode and Protected Only Mode Right Turns .....	482
Figure 4D-20	Signal Indications for Approaches with a Shared Left-Turn/Right-Turn Lane and No Through Movement.....	486
Figure 4E-1	Typical Pedestrian Signal Indications .....	496
Figure 4E-2	Pedestrian Intervals.....	498
Figure 4E-3	Pushbutton Location Area.....	501
Figure 4E-4	Typical Pushbutton Locations .....	502
Figure 4F-1	Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways.....	510
Figure 4F-2	Guidelines for the Installation of Pedestrian Hybrid Beacons on High-Speed Roadways.....	510
Figure 4F-3	Sequence for a Pedestrian Hybrid Beacon .....	511
Figure 4G-1	Sequence for an Emergency-Vehicle Hybrid Beacon .....	515
Figure 4M-1	Left-Turn Lane-Use Control Signals .....	526
Figure 5B-1	Regulatory Signs on Low-Volume Roads.....	534
Figure 5B-2	Parking Signs and Plaques on Low-Volume Roads.....	535
Figure 5C-1	Horizontal Alignment and Intersection Warning Signs and Plaques and Object Markers on Low-Volume Roads.....	536
Figure 5C-2	Other Warning Signs and Plaques on Low-Volume Roads .....	538
Figure 5F-1	Highway-Rail Grade Crossing Signs and Plaques for Low-Volume Roads.....	542
Figure 5G-1	Temporary Traffic Control Signs and Plaques on Low-Volume Roads .....	545
Figure 6C-1	Component Parts of a Temporary Traffic Control Zone .....	553
Figure 6C-2	Types of Tapers and Buffer Spaces .....	556
Figure 6C-3	Example of a One-Lane, Two-Way Traffic Taper.....	559
Figure 6E-1	Example of the Use of a STOP/SLOW Automated Flagger Assistance Device (AFAD).....	570
Figure 6E-2	Example of the Use of a Red/Yellow Lens Automated Flagger Assistance Device (AFAD).....	572
Figure 6E-3	Use of Hand-Signaling Devices by Flaggers.....	574
Figure 6F-1	Height and Lateral Location of Signs—Typical Installations.....	581
Figure 6F-2	Methods of Mounting Signs Other Than on Posts .....	582
Figure 6F-3	Regulatory Signs and Plaques in Temporary Traffic Control Zones.....	584
Figure 6F-4	Warning Signs and Plaques in Temporary Traffic Control Zones.....	588
Figure 6F-5	Exit Open and Closed and Detour Signs.....	592
Figure 6F-6	Advance Warning Arrow Board Display Specifications .....	602
Figure 6F-7	Channelizing Devices .....	605
Figure 6H-1	Work Beyond the Shoulder (TA-1) .....	635
Figure 6H-2	Blasting Zone (TA-2) .....	637
Figure 6H-3	Work on the Shoulders (TA-3) .....	639
Figure 6H-4	Short-Duration or Mobile Operation on a Shoulder (TA-4).....	641
Figure 6H-5	Shoulder Closure on a Freeway (TA-5).....	643
Figure 6H-6	Shoulder Work with Minor Encroachment (TA-6) .....	645
Figure 6H-7	Road Closure with a Diversion (TA-7).....	647
Figure 6H-8	Road Closure with an Off-Site Detour (TA-8) .....	649
Figure 6H-9	Overlapping Routes with a Detour (TA-9) .....	651
Figure 6H-10	Lane Closure on a Two-Lane Road Using Flaggers (TA-10) .....	653
Figure 6H-11	Lane Closure on a Two-Lane Road with Low Traffic Volumes (TA-11).....	655
Figure 6H-12	Lane Closure on a Two-Lane Road Using Traffic Control Signals (TA-12).....	657
Figure 6H-13	Temporary Road Closure (TA-13).....	659
Figure 6H-14	Haul Road Crossing (TA-14) .....	661
Figure 6H-15	Work in the Center of a Road with Low Traffic Volumes (TA-15) .....	663

Figure 6H-16	Surveying Along the Center Line of a Road with Low Traffic Volumes (TA-16).....	665
Figure 6H-17	Mobile Operations on a Two-Lane Road (TA-17).....	667
Figure 6H-18	Lane Closure on a Minor Street (TA-18).....	669
Figure 6H-19	Detour for One Travel Direction (TA-19).....	671
Figure 6H-20	Detour for a Closed Street (TA-20).....	673
Figure 6H-21	Lane Closure on the Near Side of an Intersection (TA-21) .....	675
Figure 6H-22	Right-Hand Lane Closure on the Far Side of an Intersection (TA-22).....	677
Figure 6H-23	Left-Hand Lane Closure on the Far Side of an Intersection (TA-23).....	679
Figure 6H-24	Half Road Closure on the Far Side of an Intersection (TA-24).....	681
Figure 6H-25	Multiple Lane Closures at an Intersection (TA-25).....	683
Figure 6H-26	Closure in the Center of an Intersection (TA-26).....	685
Figure 6H-27	Closure at the Side of an Intersection (TA-27).....	687
Figure 6H-28	Sidewalk Detour or Diversion (TA-28) .....	689
Figure 6H-29	Crosswalk Closures and Pedestrian Detours (TA-29) .....	691
Figure 6H-30	Interior Lane Closure on a Multi-Lane Street (TA-30) .....	693
Figure 6H-31	Lane Closures on a Street with Uneven Directional Volumes (TA-31) .....	695
Figure 6H-32	Half Road Closure on a Multi-Lane, High-Speed Highway (TA-32).....	697
Figure 6H-33	Stationary Lane Closure on a Divided Highway (TA-33) .....	699
Figure 6H-34	Lane Closure with a Temporary Traffic Barrier (TA-34).....	701
Figure 6H-35	Mobile Operation on a Multi-Lane Road (TA-35) .....	703
Figure 6H-36	Lane Shift on a Freeway (TA-36).....	705
Figure 6H-37	Double Lane Closure on a Freeway (TA-37).....	707
Figure 6H-38	Interior Lane Closure on a Freeway (TA-38) .....	709
Figure 6H-39	Median Crossover on a Freeway (TA-39).....	711
Figure 6H-40	Median Crossover for an Entrance Ramp (TA-40) .....	713
Figure 6H-41	Median Crossover for an Exit Ramp (TA-41) .....	715
Figure 6H-42	Work in the Vicinity of an Exit Ramp (TA-42) .....	717
Figure 6H-43	Partial Exit Ramp Closure (TA-43) .....	719
Figure 6H-44	Work in the Vicinity of an Entrance Ramp (TA-44).....	721
Figure 6H-45	Temporary Reversible Lane Using Movable Barriers (TA-45) .....	723
Figure 6H-46	Work in the Vicinity of a Grade Crossing (TA-46).....	725
Figure 6I-1	Examples of Traffic Incident Management Area Signs.....	727
Figure 7A-1	Example of School Route Plan Map.....	732
Figure 7B-1	School Area Signs .....	735
Figure 7B-2	Example of Signing for a Higher Fines School Zone without a School Crossing .....	737
Figure 7B-3	Example of Signing for a Higher Fines School Zone with a School Speed Limit .....	738
Figure 7B-4	Example of Signing for a School Crossing Outside of a School Zone .....	739
Figure 7B-5	Example of Signing for a School Zone with a School Speed Limit and a School Crossing ..	740
Figure 7B-6	In-Street Signs in School Areas .....	741
Figure 7C-1	Two-Lane Pavement Marking of “SCHOOL” .....	744
Figure 8B-1	Regulatory Signs and Plaques for Grade Crossings .....	753
Figure 8B-2	Crossbuck Assembly with a YIELD or STOP Sign on the Crossbuck Sign Support.....	754
Figure 8B-3	Crossbuck Assembly with a YIELD or STOP Sign on a Separate Sign Support.....	755
Figure 8B-4	Warning Signs and Plaques for Grade Crossings .....	759
Figure 8B-5	Example of an Emergency Notification Sign .....	762
Figure 8B-6	Example of Placement of Warning Signs and Pavement Markings at Grade Crossings .....	765
Figure 8B-7	Grade Crossing Pavement Markings.....	766
Figure 8B-8	Example of Dynamic Envelope Pavement Markings at Grade Crossings.....	767
Figure 8B-9	Examples of Light Rail Transit Vehicle Dynamic Envelope Markings for Mixed-Use Alignments.....	768
Figure 8C-1	Composite Drawing of Active Traffic Control Devices for Grade Crossings Showing Clearances .....	770
Figure 8C-2	Example of Location Plan for Flashing-Light Signals and Four-Quadrant Gates.....	774
Figure 8C-3	Light Rail Transit Signals.....	779



Figure 8C-4	Example of Flashing-Light Signal Assembly for Pedestrian Crossings .....	781
Figure 8C-5	Example of a Shared Pedestrian/Roadway Gate .....	782
Figure 8C-6	Example of a Separate Pedestrian Gate .....	782
Figure 8C-7	Examples of Placement of Pedestrian Gates .....	783
Figure 8C-8	Example of Swing Gates .....	784
Figure 8C-9	Example of Pedestrian Barriers at an Offset Grade Crossing .....	784
Figure 8C-10	Examples of Pedestrian Barrier Installation at an Offset Non-Intersection Grade Crossing...	785
Figure 8D-1	Example of Signing and Markings for a Pathway Grade Crossing .....	787
Figure 9B-1	Sign Placement on Shared-Use Paths .....	790
Figure 9B-2	Regulatory Signs and Plaques for Bicycle Facilities .....	793
Figure 9B-3	Warning Signs and Plaques and Object Markers for Bicycle Facilities .....	797
Figure 9B-4	Guide Signs and Plaques for Bicycle Facilities .....	799
Figure 9B-5	Example of Signing for the Beginning and End of a Designated Bicycle Route on a Shared-Use Path .....	801
Figure 9B-6	Example of Bicycle Guide Signing .....	802
Figure 9B-7	Examples of Signing and Markings for a Shared-Use Path Crossing .....	803
Figure 9B-8	Example of Mode-Specific Guide Signing on a Shared-Use Path .....	805
Figure 9C-1	Example of Intersection Pavement Markings—Designated Bicycle Lane with Left-Turn Area, Heavy Turn Volumes, Parking, One-Way Traffic, or Divided Highway.....	807
Figure 9C-2	Examples of Center Line Markings for Shared-Use Paths.....	808
Figure 9C-3	Word, Symbol, and Arrow Pavement Markings for Bicycle Lanes.....	809
Figure 9C-4	Example of Bicycle Lane Treatment at a Right Turn Only Lane .....	811
Figure 9C-5	Example of Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane .....	812
Figure 9C-6	Example of Pavement Markings for Bicycle Lanes on a Two-Way Street.....	813
Figure 9C-7	Bicycle Detector Pavement Marking.....	814
Figure 9C-8	Examples of Obstruction Pavement Markings .....	815
Figure 9C-9	Shared Lane Marking .....	815

## TABLES

## Page

Table I-1	Evolution of the MUTCD.....	I-2
Table I-2	Target Compliance Dates Established by the FHWA .....	I-4
Table 1A-1	Acceptable Abbreviations .....	24
Table 1A-2	Abbreviations that Shall be Used Only on Portable Changeable Message Signs.....	25
Table 1A-3	Unacceptable Abbreviations.....	26
Table 2A-1	Illumination of Sign Elements.....	29
Table 2A-2	Retroreflection of Sign Elements.....	29
Table 2A-3	Minimum Maintained Retroreflectivity Levels.....	31
Table 2A-4	Use of Sign Shapes.....	32
Table 2A-5	Common Uses of Sign Colors .....	33
Table 2B-1	Regulatory Sign and Plaque Sizes.....	46
Table 2B-2	Meanings of Symbols and Legends on Reversible Lane Control Signs .....	65
Table 2C-1	Categories of Warning Signs and Plaques.....	104
Table 2C-2	Warning Sign and Plaque Sizes.....	105
Table 2C-3	Minimum Size of Supplemental Warning Plaques .....	107
Table 2C-4	Guidelines for Advance Placement of Warning Signs .....	108
Table 2C-5	Horizontal Alignment Sign Selection .....	110
Table 2C-6	Approximate Spacing of Chevron Alignment Signs on Horizontal Curves.....	113
Table 2D-1	Conventional Road Guide Sign Sizes .....	139
Table 2D-2	Recommended Minimum Letter Heights on Street Name Signs .....	163
Table 2E-1	Freeway or Expressway Guide Sign and Plaque Sizes .....	186

Table 2E-2	Minimum Letter and Numeral Sizes for Expressway Guide Signs According to Interchange Classification .....	188
Table 2E-3	Minimum Letter and Numeral Sizes for Expressway Guide Signs According to Sign Type..	189
Table 2E-4	Minimum Letter and Numeral Sizes for Freeway Guide Signs According to Interchange Classification .....	190
Table 2E-5	Minimum Letter and Numeral Sizes for Freeway Guide Signs According to Sign Type .....	191
Table 2F-1	Toll Facility Sign and Plaque Minimum Sizes .....	237
Table 2G-1	Managed and Preferential Lanes Sign and Plaque Minimum Sizes.....	254
Table 2H-1	General Information Sign Sizes .....	292
Table 2I-1	General Service Sign and Plaque Sizes .....	299
Table 2J-1	Minimum Letter and Numeral Sizes for Specific Service Signs According to Sign Type.....	316
Table 2L-1	Example of Units of Information .....	328
Table 2M-1	Category Chart for Recreational and Cultural Interest Area Symbols.....	331
Table 2N-1	Emergency Management Sign Sizes .....	343
Table 3B-1	Minimum Passing Sight Distances for No-Passing Zone Markings .....	352
Table 3D-1	Standard Edge Line and Lane Line Markings for Preferential Lanes.....	417
Table 3F-1	Approximate Spacing for Delineators on Horizontal Curves .....	427
Table 4C-1	Warrant 1, Eight-Hour Vehicular Volume .....	438
Table 4C-2	Warrant 9, Adjustment Factor for Daily Frequency of Rail Traffic.....	448
Table 4C-3	Warrant 9, Adjustment Factor for Percentage of High-Occupancy Buses.....	448
Table 4C-4	Warrant 9, Adjustment Factor for Percentage of Tractor-Trailer Trucks .....	448
Table 4D-1	Recommended Minimum Number of Primary Signal Faces for Through Traffic on Approaches with Posted, Statutory, or 85 <sup>th</sup> -Percentile Speed of 45 mph or Higher .....	461
Table 4D-2	Minimum Sight Distance for Signal Visibility.....	461
Table 5A-1	Sign and Plaque Sizes on Low-Volume Roads .....	532
Table 6C-1	Recommended Advance Warning Sign Minimum Spacing.....	554
Table 6C-2	Stopping Sight Distance as a Function of Speed.....	555
Table 6C-3	Taper Length Criteria for Temporary Traffic Control Zones .....	557
Table 6C-4	Formulas for Determining Taper Length .....	557
Table 6E-1	Stopping Sight Distance as a Function of Speed.....	575
Table 6F-1	Temporary Traffic Control Zone Sign and Plaque Sizes .....	578
Table 6H-1	Index to Typical Applications .....	632
Table 6H-2	Meaning of Symbols on Typical Application Diagrams .....	633
Table 6H-3	Meaning of Letter Codes on Typical Application Diagrams .....	633
Table 6H-4	Formulas for Determining Taper Length .....	633
Table 7B-1	School Area Sign and Plaque Sizes.....	733
Table 8B-1	Grade Crossing Sign and Plaque Minimum Sizes .....	752
Table 9B-1	Bicycle Facility Sign and Plaque Minimum Sizes .....	791
Table A2-1	Conversion of Inches to Millimeters .....	A2-1
Table A2-2	Conversion of Feet to Meters .....	A2-1
Table A2-3	Conversion of Miles to Kilometers .....	A2-1
Table A2-4	Conversion of Miles per Hour to Kilometers/Hour .....	A2-1

## MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

### INTRODUCTION

#### Standard:

- 01 **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, bikeway, or private road open to public travel (see definition in Section 1A.13) by authority of a public agency or official having jurisdiction, or, in the case of a private road, by authority of the private owner or private official having jurisdiction.**
- 02 **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, bikeway, or private road open to public travel (see definition in Section 1A.13) 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.**
- 03 **In accordance with 23 CFR 655.603(a), for the purposes of applicability of the MUTCD:**
- A. **Toll roads under the jurisdiction of public agencies or authorities or public-private partnerships shall be considered to be public highways;**
  - B. **Private roads open to public travel shall be as defined in Section 1A.13; and**
  - C. **Parking areas, including the driving aisles within those parking areas, that are either publicly or privately owned shall not be considered to be “open to public travel” for purposes of MUTCD applicability.**
- 04 **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 items owned by FHWA.**

#### Support:

- 05 Pictographs, as defined in Section 1A.13, are embedded in traffic control devices but the pictographs themselves are not considered traffic control devices for the purposes of Paragraph 4.
- 06 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 nine 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:

- 07 **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:

- 08 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.

#### Guidance:

- 09 *The States should 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.”*



**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	11/04, 12/07
2009	Manual on Uniform Traffic Control Devices for Streets and Highways	

**Support:**

10 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, highways, bikeways, and private roads open to public travel (see definition in Section 1A.13).

11 Throughout this Manual the headings Standard, Guidance, Option, and Support are used to classify the nature of the text that follows. Figures and tables, including the notes contained therein, 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 note contained therein.

**Standard:**

12 **When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be as defined in Paragraph 1 of Section 1A.13.**

**Support:**

13 Throughout this Manual all dimensions and distances are provided in English units. Appendix A2 contains tables for converting each of the English unit numerical values that are used in this Manual to the equivalent Metric (International System of Units) values.

**Guidance:**

14 *If Metric units are to be used in laying out distances or determining sizes of devices, such units should be specified on plan drawings and made known to those responsible for designing, installing, or maintaining traffic control devices.*

15 *Except when a specific numeral is required or recommended by the text of a Section of this Manual, numerals displayed on the images of devices 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 devices, the numerals should be appropriately altered to fit the specific situation.*

**Support:**

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

17 There are nine 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, Barricades, and Gates. 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.

- 18 Each Section is comprised of one or more paragraphs. The paragraphs are indented and are identified by a number. 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 40 feet beyond the stop line” that appears in Section 4D.14 of this Manual would be referenced in writing as “Section 4D.14, P1, A.1,” and would be verbally referenced as “Item A.1 of Paragraph 1 of Section 4D.14.”

**Standard:**

- 19 **In accordance with 23 CFR 655.603(b)(3), 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 the effective date of the Final Rule for the changes. Substantial conformance of such State or other Federal agency MUTCDs or Supplements shall be as defined in 23 CFR 655.603(b)(1).**
- 20 **After the effective date of a new edition of the MUTCD or a revision thereto, or after the adoption thereof by the State, whichever occurs later, new or reconstructed devices installed shall be in compliance with the new edition or revision.**
- 21 **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) and (d)(3)].**
- 22 **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). The FHWA has the authority to establish other target compliance dates for implementation of particular changes to the MUTCD [23 CFR 655.603(d)(1)]. These target compliance dates established by the FHWA shall be as shown in Table I-2.**
- 23 **Except as provided in Paragraph 24, when a non-compliant traffic control device is being replaced or refurbished because it is damaged, missing, or no longer serviceable for any reason, it shall be replaced with a compliant device.**
- Option:
- 24 A damaged, missing, or otherwise non-serviceable device that is non-compliant may be replaced in kind if engineering judgment indicates that:
- A. One compliant device in the midst of a series of adjacent non-compliant devices would be confusing to road users; and/or
  - B. The schedule for replacement of the whole series of non-compliant devices will result in achieving timely compliance with the MUTCD.

**Table I-2. Target Compliance Dates Established by the FHWA (Sheet 1 of 3)**

2009 MUTCD Section Number(s)	2009 MUTCD Section Title	Specific Provision	Compliance Date
2A.08	Minimum Retroreflectivity Levels	Implementation and continued use of an assessment or management method that is designed to maintain traffic sign retroreflectivity at or above the established minimum levels	January 22, 2012 (c)
2A.08	Minimum Retroreflectivity Levels	Replacement of regulatory, warning, and post-mounted guide (except street name) signs that are identified using the assessment or management method as failing to meet the established minimum levels	January 22, 2015 (c)
2A.08	Minimum Retroreflectivity Levels	Replacement of street name signs and overhead guide signs that are identified using the assessment or management method as failing to meet the established minimum levels.	January 22, 2018 (c)
2A.19	Lateral Offset	Crashworthiness of sign supports on roads with posted speed limit of 50 mph or higher	January 17, 2013 (a)
2B.03	Size of Regulatory Signs	Increased sign sizes and other 2003 MUTCD revisions to Table 2B-1 (*)	December 22, 2013 (b)
2B.09	YIELD Sign Applications	Changes in YIELD sign application criteria from the 1988 MUTCD to the 2003 MUTCD (*)	January 17, 2011 (a)
2B.10	STOP Sign or YIELD Sign Placement	Signs mounted on the back of STOP or YIELD signs should not obscure shape of STOP sign, with exception for DO NOT ENTER signs (2003 MUTCD Sections 2B.06 and 2B.10) (*)	December 22, 2013 (b)
2B.11	Yield Here To Pedestrians Signs and Stop Here For Pedestrians Signs (R1-5 Series)	New Section 2B.11 in the 2003 MUTCD (*)	December 22, 2013 (b)
2B.13	Speed Limit Sign (R2-1)	Color of changeable message legend of YOUR SPEED legend	December 22, 2013 (b)
2B.26	Reversible Lane Control Signs (R3-9e through R3-9i)	Removal of the R3-9c and R3-9e signs that had been included in the 2000 MUTCD (2003 MUTCD Section 2B.25)	December 22, 2013 (b)
2B.40	ONE WAY Signs (R6-1, R6-2)	New requirement in the 2009 MUTCD for the number and locations of ONE WAY signs	December 31, 2019
2B.55	Photo Enforced Signs and Plaques (R10-18, R10-19P, R10-19aP)	New signs (2003 MUTCD Section 2B.46) (*)	December 22, 2013 (b)
2C.04	Size of Warning Signs	New sizes in the 2003 MUTCD for the W1 Series arrow signs, the W12-2a low clearance signs, the W7 Series runaway truck signs, and the W10-1 advance grade crossing sign (*)	December 22, 2013 (b)
2C.06 thru 2C.14	Horizontal Alignment Warning Signs	Revised requirements in the 2009 MUTCD regarding the use of various horizontal alignment signs	December 31, 2019
2C.13	Truck Rollover Warning Sign (W1-13)	New W1-13 sign (2003 MUTCD Section 2C.11)	December 22, 2013 (b)
2C.20	NARROW BRIDGE Sign (W5-2)	Elimination of symbol sign (2003 MUTCD Section 2C.16)	December 22, 2013 (b)
2C.30	PAVEMENT ENDS Sign (W8-3)	Removal of symbol sign (2000 MUTCD Section 2C.23)	January 17, 2011 (a)
2C.38	Reduced Speed Limit Ahead 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 (2003 MUTCD Section 2C.30)	December 22, 2018 (b)
2C.40	Merge Signs (W4-1, W4-5)	New Entering Roadway Merge sign (W4-5) (2003 MUTCD Section 2C.31)	December 22, 2013 (b)
2C.41	Added Lane Signs (W4-3, W4-6)	New Entering Roadway Added Lane sign (W4-6) (2003 MUTCD Section 2C.32)	December 22, 2013 (b)
2C.42	Lane Ends Signs (W4-2, W9-1, W9-2)	New design of W4-2 sign (2003 MUTCD Section 2C.33)	December 22, 2013 (b)
2C.46	Intersection Warning Signs (W2-1 through W2-8)	New design of Circular Intersection (W2-6) sign (2003 MUTCD Section 2C.37)	December 22, 2013 (b)
2C.49	Vehicular Traffic Warning Signs	New symbol signs W11-1, W11-5, W11-5a, W11-6, W11-11, and W11-14 (2003 MUTCD Section 2C.40)	December 22, 2013 (b)

**Table I-2. Target Compliance Dates Established by the FHWA (Sheet 2 of 3)**

2009 MUTCD Section Number(s)	2009 MUTCD Section Title	Specific Provision	Compliance Date
2C.50	Non-Vehicular Warning Signs	Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow (W16-7P) supplemental plaque if at the crossing (2003 MUTCD Section 2C.41)	January 17, 2011 (a)(b)
2C.61	PHOTO ENFORCED Plaque (W16-10P)	New plaque (2003 MUTCD Section 2C.53) (*)	December 22, 2013 (b)
2C.63	Object Marker Design and Placement Height	Width of stripes on Type 3 striped marker (2003 MUTCD Section 3C.01)	December 22, 2013 (b)
2D.43	Street Name Signs (D3-1 or D3-1a)	6-inch letter height for lettering on post-mounted Street Name signs (except on multi-lane streets with speed limits greater than 40 mph) (2000 MUTCD Section 2D.38)	January 9, 2012 (a)
2D.43	Street Name Signs (D3-1 or D3-1a)	8-inch letter height on post-mounted signs on multi-lane streets with speed limits greater than 40 mph and 12-inch letter height on overhead signs (2003 MUTCD Section 2D.38)	December 22, 2018 (b)
2D.44	Advance Street Name Signs (D3-2)	Requirements of new Section 2D.39 in the 2003 MUTCD	December 22, 2018 (b)
2D.45	Signing on Conventional Roads on Approaches to Interchanges	New requirement in the 2009 MUTCD for multi-lane approaches to interchanges to have guide signs to identify which direction of turn is to be made for access to each direction of the freeway or expressway	December 31, 2019
2E.31, 2E.33, and 2E.36	Plaques for Left-Hand Exits	New requirement in the 2009 MUTCD to use E1-5aP and E1-5bP plaques for left-hand exits	December 31, 2014
2G.01 through 2G.07	Regulatory Signs for Preferential Lanes	Requirements for regulatory signs for preferential lanes (2003 MUTCD Sections 2B.26 through 2B.28) (*)	December 22, 2013 (b)
2G.11 through 2G.15	Preferential Lane Guide Signs	New Section 2E.59 in the 2003 MUTCD (*)	December 22, 2013 (b)
2H.02, 2H.03	Reference Location Signs, Intermediate Reference Location Signs, and Enhanced Reference Location Signs	Location and spacing of Reference Location signs and design of Intermediate Reference Location signs (2003 MUTCD Sections 2D.46 and 2E.54)	December 22, 2013 (b)
2I.07	Radio Information Signing	New Channel 9 Monitored (D12-3) sign (2003 MUTCD Section 2D.45)	December 22, 2013 (b)
2I.08	TRAVEL INFO CALL 511 Signs (D12-5 and D12-5a)	New TRAVEL INFO CALL 511 Sign (D12-5) (2003 MUTCD Section 2D.45)	December 22, 2013 (b)
2J.05	Size of Lettering	Minimum height of letters and numerals on Specific Service signs (2000 MUTCD Section 2F.05)	January 17, 2011 (a)
2N.03	Evacuation Route Signs (EM-1 and EM-1a)	New design and size of EM-1 sign (2003 MUTCD Section 2I.03)	December 22, 2018 (b)
3B.04, 3B.05	White Longitudinal Pavement Markings	New requirement in the 2009 MUTCD for dotted lane lines for dropped lanes and for acceleration, deceleration, and auxiliary lanes	December 31, 2016 or resurfacing, whichever occurs first
3B.18	Crosswalk Markings	Gap between transverse lines of a crosswalk (2003 MUTCD Section 3B.17)	December 22, 2013 (b)
4D.01	General	Location of signalized midblock crosswalks	December 22, 2013 (b)
4D.26	Yellow Change and Red Clearance Intervals	New requirement in the 2009 MUTCD that durations of yellow change and red clearance intervals shall be determined using engineering practices	December 31, 2014, or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first
4D.31	Flashing Operation—Transition Out of Flashing Mode	Duration of steady red clearance interval in change from red-red flashing mode to steady (stop-and-go) mode (2003 MUTCD Section 4D.12)	December 22, 2013 (b)
4E.06	Pedestrian Intervals and Signal Phases	New requirement in the 2009 MUTCD that the pedestrian change interval shall not extend into the red clearance interval and shall be followed by a buffer interval of at least 3 seconds	December 31, 2014, or when timing adjustments are made to the individual intersection and/or corridor, whichever occurs first
4E.07	Countdown Pedestrian Signals	Pedestrian countdown hardware requirements	December 22, 2013 (b)

**Table I-2. Target Compliance Dates Established by the FHWA (Sheet 3 of 3)**

2009 MUTCD Section Number(s)	2009 MUTCD Section Title	Specific Provision	Compliance Date
5C.05	NARROW BRIDGE Sign (W5-2)	Elimination of symbol sign	December 22, 2013 (b)
6D.03	Worker Safety Considerations	New requirement in the 2009 MUTCD that all workers within the right-of-way shall wear high-visibility apparel	December 31, 2011
6E.02	High-Visibility Safety Apparel	New requirement in the 2009 MUTCD that all flaggers within the right-of-way shall wear high-visibility apparel	December 31, 2011
7B.11	School Advance Crossing Assembly	Use of AHEAD (W16-9P) plaque or distance plaque (W16-2P or W16-2aP) (2000 MUTCD Section 7B.08)	January 17, 2011 (a)
7B.12	School Crossing Assembly	Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow (W16-7P) supplemental plaque (2000 MUTCD Sections 7B.08 and 7B.09)	January 17, 2011 (a)
7B.16	Reduced School Speed Limit Ahead Sign (S4-5, S4-5a)	Removal of R2-5 Series Reduced Speed Ahead signs and use of S4-5 or S4-5a warning signs instead (2003 MUTCD Section 7B.12)	December 22, 2018 (b)
7D.04	Uniform of Adult Crossing Guards	New requirement in the 2009 MUTCD for high-visibility apparel for adult crossing guards	December 31, 2011
8B.03	Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Plaque (R15-2P) at Active and Passive Grade Crossings	Retroreflective strip on crossbuck support (2000 MUTCD Section 8B.02) (*)	January 17, 2011 (a)
8B.04	Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings	New requirement in the 2009 MUTCD for the use of STOP or YIELD signs with Crossbuck signs at passive grade crossings	December 31, 2019
8B.19 and 8C.02 through 8C.05	LRT Approaching-Activated Blank-Out Warning Sign, Flashing Light Signals, and Automatic Gates	Automatic gates, flashing-light signals, and blank-out signs at highway-LRT crossings per Part 10 of the 2000 MUTCD (*)	January 17, 2011 (a)
8C.09	Traffic Control Signals at or Near Highway-Rail Grade Crossings	Pre-signals (2003 MUTCD Section 8D.07)	December 22, 2013 (b)
8C.12	Grade Crossings Within or In Close Proximity to Circular Intersections	New requirement in the 2009 MUTCD for study of grade crossings near roundabouts	December 31, 2014
9B.18	Bicycle Warning and Combined Bicycle/Pedestrian Signs (W11-1 and W11-15)	Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow (W16-7P) supplemental plaque if at the crossing (2000 MUTCD Section 9B.15)	January 17, 2011 (a)

Notes: Unless otherwise noted, dates are as established in the Final Rule for the 2009 MUTCD.

(a) Date established in the Final Rule for the 2000 MUTCD

(b) Date established in the Final Rule for the 2003 MUTCD

(c) Date established in the Final Rule for Revision 2 of the 2003 MUTCD

(\*) Provisions may have been revised in the 2009 MUTCD



# PART 1

## GENERAL

### CHAPTER 1A. GENERAL

#### Section 1A.01 Purpose of Traffic Control Devices

Support:

- 01 The purpose of traffic control devices, as well as the principles for their use, is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets, highways, bikeways, and private roads open to public travel throughout the Nation.
- 02 Traffic control devices notify road users of regulations and provide warning and guidance needed for the uniform and efficient operation of all elements of the traffic stream in a manner intended to minimize the occurrences of crashes.

**Standard:**

- 03 **Traffic control devices or their supports shall not bear any advertising message or any other message that is not related to traffic control.**

Support:

- 04 Tourist-oriented directional signs and Specific Service signs are not considered advertising; rather, they are classified as motorist service signs.

#### Section 1A.02 Principles of Traffic Control Devices

Support:

- 01 This Manual contains the basic principles that govern the design and use of traffic control devices for all streets, highways, bikeways, and private roads open to public travel (see definition in Section 1A.13) regardless of type or class or the public agency, official, or owner having jurisdiction. This Manual's text specifies the restriction on the use of a device if it is intended for limited application or for a specific system. It is important that these principles be given primary consideration in the selection and application of each device.

*Guidance:*

- 02 *To be effective, a traffic control device should meet five basic requirements:*
- A. Fulfill a need;*
  - B. Command attention;*
  - C. Convey a clear, simple meaning;*
  - D. Command respect from road users; and*
  - E. Give adequate time for proper response.*
- 03 *Design, placement, operation, maintenance, and uniformity are aspects that should be carefully considered in order to maximize the ability of a traffic control device to meet the five requirements listed in the previous paragraph. Vehicle speed should be carefully considered as an element that governs the design, operation, placement, and location of various traffic control devices.*

Support:

- 04 The definition of the word "speed" varies depending on its use. The definitions of specific speed terms are contained in Section 1A.13.

*Guidance:*

- 05 *The actions required of road users to obey regulatory devices should be specified by State statute, or in cases not covered by State statute, by local ordinance or resolution. Such statutes, ordinances, and resolutions should be consistent with the "Uniform Vehicle Code" (see Section 1A.11).*
- 06 *The proper use of traffic control devices should provide the reasonable and prudent road user with the information necessary to efficiently and lawfully use the streets, highways, pedestrian facilities, and bikeways.*

Support:

- 07 Uniformity of the meaning of traffic control devices is vital to their effectiveness. The meanings ascribed to devices in this Manual are in general accord with the publications mentioned in Section 1A.11.

#### Section 1A.03 Design of Traffic Control Devices

*Guidance:*

- 01 *Devices should be designed so that features such as size, shape, color, composition, lighting or retroreflection, and contrast are combined to draw attention to the devices; that size, shape, color, and simplicity of message combine to produce a clear meaning; that legibility and size combine with placement to permit adequate time for response; and that uniformity, size, legibility, and reasonableness of the message combine to command respect.*
- 02 *Aspects of a device's standard design should be modified only if there is a demonstrated need.*

Support:

- 03 An example of modifying a device's design would be to modify the Combination Horizontal Alignment/Intersection (W1-10) sign to show intersecting side roads on both sides rather than on just one side of the major road within the curve.

Option:

- 04 With the exception of symbols and colors, minor modifications in the specific design elements of a device may be made provided the essential appearance characteristics are preserved.

#### **Section 1A.04 Placement and Operation of Traffic Control Devices**

*Guidance:*

- 01 *Placement of a traffic control device should be within the road user's view so that adequate visibility is provided. To aid in conveying the proper meaning, the traffic control device should be appropriately positioned with respect to the location, object, or situation to which it applies. The location and legibility of the traffic control device should be such that a road user has adequate time to make the proper response in both day and night conditions.*
- 02 *Traffic control devices should be placed and operated in a uniform and consistent manner.*
- 03 *Unnecessary traffic control devices should be removed. The fact that a device is in good physical condition should not be a basis for deferring needed removal or change.*

#### **Section 1A.05 Maintenance of Traffic Control Devices**

*Guidance:*

- 01 *Functional maintenance of traffic control devices should be used to determine if certain devices need to be changed to meet current traffic conditions.*
- 02 *Physical maintenance of traffic control devices should be performed to retain the legibility and visibility of the device, and to retain the proper functioning of the device.*

Support:

- 03 Clean, legible, properly mounted devices in good working condition command the respect of road users.

#### **Section 1A.06 Uniformity of Traffic Control Devices**

Support:

- 01 Uniformity of devices simplifies the task of the road user because it aids in recognition and understanding, thereby reducing perception/reaction time. Uniformity assists road users, law enforcement officers, and traffic courts by giving everyone the same interpretation. Uniformity assists public highway officials through efficiency in manufacture, installation, maintenance, and administration. Uniformity means treating similar situations in a similar way. The use of uniform traffic control devices does not, in itself, constitute uniformity. A standard device used where it is not appropriate is as objectionable as a non-standard device; in fact, this might be worse, because such misuse might result in disrespect at those locations where the device is needed and appropriate.

#### **Section 1A.07 Responsibility for Traffic Control Devices**

**Standard:**

- 01 **The responsibility for the design, placement, operation, maintenance, and uniformity of traffic control devices shall rest with the public agency or the official having jurisdiction, or, in the case of private roads open to public travel, with the private owner or private official having jurisdiction. 23 CFR 655.603 adopts the MUTCD as the national standard for all traffic control devices installed on any street, highway, bikeway, or private road open to public travel (see definition in Section 1A.13). When a State or other Federal agency manual or supplement is required, that manual or supplement shall be in substantial conformance with the National MUTCD.**
- 02 **23 CFR 655.603 also states that traffic control devices on all streets, highways, bikeways, and private roads open to public travel in each State shall be in substantial conformance with standards issued or endorsed by the Federal Highway Administrator.**

Support:

- 03 The Introduction of this Manual contains information regarding the meaning of substantial conformance and the applicability of the MUTCD to private roads open to public travel.
- 04 The "Uniform Vehicle Code" (see Section 1A.11) has the following provision in Section 15-104 for the adoption of a uniform manual:

“(a) The [State Highway Agency] shall adopt a manual and specification for a uniform system of traffic control devices consistent with the provisions of this code for use upon highways within this State. Such uniform system shall correlate with and so far as possible conform to the system set forth in the most recent edition of the Manual on Uniform Traffic Control Devices for Streets and Highways, and other standards issued or endorsed by the Federal Highway Administrator.”

“(b) The Manual adopted pursuant to subsection (a) shall have the force and effect of law.”

- 05 All States have officially adopted the National MUTCD either in its entirety, with supplemental provisions, or as a separate published document.

*Guidance:*

- 06 *These individual State manuals or supplements should be reviewed for specific provisions relating to that State.*

*Support:*

- 07 The National MUTCD has also been adopted by the National Park Service, the U.S. Forest Service, the U.S. Military Command, the Bureau of Indian Affairs, the Bureau of Land Management, and the U.S. Fish and Wildlife Service.

*Guidance:*

- 08 *States should adopt Section 15-116 of the “Uniform Vehicle Code,” 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.”*

## **Section 1A.08 Authority for Placement of Traffic Control Devices**

**Standard:**

- 01 **Traffic control devices, advertisements, announcements, and other signs or messages within the highway right-of-way shall be placed only as authorized by a public authority or the official having jurisdiction, or, in the case of private roads open to public travel, by the private owner or private official having jurisdiction, for the purpose of regulating, warning, or guiding traffic .**

- 02 **When the public agency or the official having jurisdiction over a street or highway or, in the case of private roads open to public travel, the private owner or private official having jurisdiction, has granted proper authority, others such as contractors and public utility companies shall be permitted to install temporary traffic control devices in temporary traffic control zones. Such traffic control devices shall conform with the Standards of this Manual.**

- 03 **All regulatory traffic control devices shall be supported by laws, ordinances, or regulations.**

*Support:*

- 04 Provisions of this Manual are based upon the concept that effective traffic control depends upon both appropriate application of the devices and reasonable enforcement of the regulations.

- 05 Although some highway design features, such as curbs, median barriers, guardrails, speed humps or tables, and textured pavement, have a significant impact on traffic operations and safety, they are not considered to be traffic control devices and provisions regarding their design and use are generally not included in this Manual.

- 06 Certain types of signs and other devices that do not have any traffic control purpose are sometimes placed within the highway right-of-way by or with the permission of the public agency or the official having jurisdiction over the street or highway. Most of these signs and other devices are not intended for use by road users in general, and their message is only important to individuals who have been instructed in their meanings. These signs and other devices are not considered to be traffic control devices and provisions regarding their design and use are not included in this Manual. Among these signs and other devices are the following:

- A. Devices whose purpose is to assist highway maintenance personnel. Examples include markers to guide snowplow operators, devices that identify culvert and drop inlet locations, and devices that precisely identify highway locations for maintenance or mowing purposes.
- B. Devices whose purpose is to assist fire or law enforcement personnel. Examples include markers that identify fire hydrant locations, signs that identify fire or water district boundaries, speed measurement pavement markings, small indicator lights to assist in enforcement of red light violations, and photo enforcement systems.
- C. Devices whose purpose is to assist utility company personnel and highway contractors, such as markers that identify underground utility locations.
- D. Signs posting local non-traffic ordinances.
- E. Signs giving civic organization meeting information.

**Standard:**

- 07 **Signs and other devices that do not have any traffic control purpose that are placed within the highway right-of-way shall not be located where they will interfere with, or detract from, traffic control devices.**

*Guidance:*

- 08 *Any unauthorized traffic control device or other sign or message placed on the highway right-of-way by a private organization or individual constitutes a public nuisance and should be removed. All unofficial or non-essential traffic control devices, signs, or messages should be removed.*

**Section 1A.09 Engineering Study and Engineering Judgment****Support:**

- 01 Definitions of an engineering study and engineering judgment are contained in Section 1A.13.

**Standard:**

- 02 **This Manual describes the application of traffic control devices, but shall not be a legal requirement for their installation.**

*Guidance:*

- 03 *Early in the processes of location and design of roads and streets, engineers should coordinate such location and design with the design and placement of the traffic control devices to be used with such roads and streets.*
- 04 *Jurisdictions, or owners of private roads open to public travel, with responsibility for traffic control that do not have engineers on their staffs who are trained and/or experienced in traffic control devices should seek engineering assistance from others, such as the State transportation agency, their county, a nearby large city, or a traffic engineering consultant.*

**Support:**

- 05 As part of the Federal-aid Program, each State is required to have a Local Technology Assistance Program (LTAP) and to provide technical assistance to local highway agencies. Requisite technical training in the application of the principles of the MUTCD is available from the State's Local Technology Assistance Program for needed engineering guidance and assistance.

**Section 1A.10 Interpretations, Experimentations, Changes, and Interim Approvals****Standard:**

- 01 **Design, application, and placement of traffic control devices other than those adopted in this Manual shall be prohibited unless the provisions of this Section are followed.**

**Support:**

- 02 Continuing advances in technology will produce changes in the highway, vehicle, and road user proficiency; therefore, portions of the system of traffic control devices in this Manual will require updating. In addition, unique situations often arise for device applications that might require interpretation or clarification of this Manual. It is important to have a procedure for recognizing these developments and for introducing new ideas and modifications into the system.

**Standard:**

- 03 **Except as provided in Paragraph 4, requests for any interpretation, permission to experiment, interim approval, or change shall be submitted electronically to the Federal Highway Administration (FHWA), Office of Transportation Operations, MUTCD team, at the following e-mail address: MUTCDofficialrequest@dot.gov.**

**Option:**

- 04 If electronic submittal is not possible, requests for interpretations, permission to experiment, interim approvals, or changes may instead be mailed to the Office of Transportation Operations, HOTO-1, Federal Highway Administration, 1200 New Jersey Avenue, SE, Washington, DC 20590.

**Support:**

- 05 Communications regarding other MUTCD matters that are not related to official requests will receive quicker attention if they are submitted electronically to the MUTCD Team Leader or to the appropriate individual MUTCD team member. Their e-mail addresses are available through the links contained on the "Who's Who" page on the MUTCD website at <http://mutcd.fhwa.dot.gov/team.htm>.
- 06 An interpretation includes a consideration of the application and operation of standard traffic control devices, official meanings of standard traffic control devices, or the variations from standard device designs.

*Guidance:*

07 *Requests for an interpretation of this Manual should contain the following information:*

- A. A concise statement of the interpretation being sought;*
- B. A description of the condition that provoked the need for an interpretation;*
- C. Any illustration that would be helpful to understand the request; and*
- D. Any supporting research data that is pertinent to the item to be interpreted.*

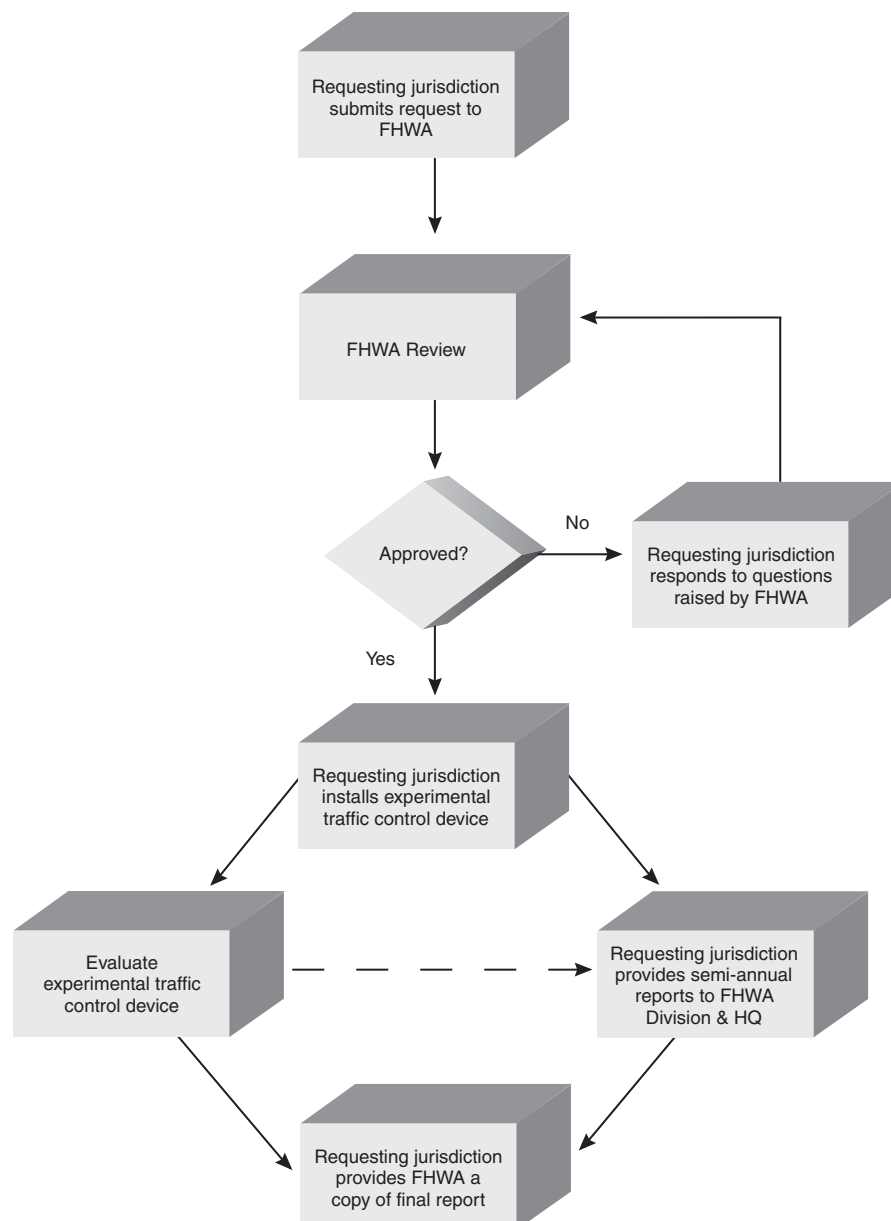
*Support:*

08 Requests to experiment include consideration of field deployment for the purpose of testing or evaluating a new traffic control device, its application or manner of use, or a provision not specifically described in this Manual.

09 A request for permission to experiment will be considered only when submitted by the public agency or toll facility operator responsible for the operation of the road or street on which the experiment is to take place. For a private road open to public travel, the request will be considered only if it is submitted by the private owner or private official having jurisdiction.

10 A diagram indicating the process for experimenting with traffic control devices is shown in Figure 1A-1.

**Figure 1A-1. Process for Requesting and Conducting Experimentations for New Traffic Control Devices**





*Guidance:*

- 11 *The request for permission to experiment should contain the following:*
- A. *A statement indicating the nature of the problem.*
  - B. *A description of the proposed change to the traffic control device or application of the traffic control device, how it was developed, the manner in which it deviates from the standard, and how it is expected to be an improvement over existing standards.*
  - C. *Any illustration that would be helpful to understand the traffic control device or use of the traffic control device.*
  - D. *Any supporting data explaining how the traffic control device was developed, if it has been tried, in what ways it was found to be adequate or inadequate, and how this choice of device or application was derived.*
  - E. *A legally binding statement certifying that the concept of the traffic control device is not protected by a patent or copyright. (An example of a traffic control device concept would be countdown pedestrian signals in general. Ordinarily an entire general concept would not be patented or copyrighted, but if it were it would not be acceptable for experimentation unless the patent or copyright owner signs a waiver of rights acceptable to the FHWA. An example of a patented or copyrighted specific device within the general concept of countdown pedestrian signals would be a manufacturer's design for its specific brand of countdown signal, including the design details of the housing or electronics that are unique to that manufacturer's product. As long as the general concept is not patented or copyrighted, it is acceptable for experimentation to incorporate the use of one or more patented devices of one or several manufacturers.)*
  - F. *The time period and location(s) of the experiment.*
  - G. *A detailed research or evaluation plan that must provide for close monitoring of the experimentation, especially in the early stages of its field implementation. The evaluation plan should include before and after studies as well as quantitative data describing the performance of the experimental device.*
  - H. *An agreement to restore the site of the experiment to a condition that complies with the provisions of this Manual within 3 months following the end of the time period of the experiment. This agreement must also provide that the agency sponsoring the experimentation will terminate the experimentation at any time that it determines significant safety concerns are directly or indirectly attributable to the experimentation. The FHWA's Office of Transportation Operations has the right to terminate approval of the experimentation at any time if there is an indication of safety concerns. If, as a result of the experimentation, a request is made that this Manual be changed to include the device or application being experimented with, the device or application will be permitted to remain in place until an official rulemaking action has occurred.*
  - I. *An agreement to provide semi-annual progress reports for the duration of the experimentation, and an agreement to provide a copy of the final results of the experimentation to the FHWA's Office of Transportation Operations within 3 months following completion of the experimentation. The FHWA's Office of Transportation Operations has the right to terminate approval of the experimentation if reports are not provided in accordance with this schedule.*

*Support:*

- 12 *A change includes consideration of a new device to replace a present standard device, an additional device to be added to the list of standard devices, or a revision to a traffic control device application or placement criteria.*

*Guidance:*

- 13 *Requests for a change to this Manual should contain the following information:*
- A. *A statement indicating what change is proposed;*
  - B. *Any illustration that would be helpful to understand the request; and*
  - C. *Any supporting research data that is pertinent to the item to be reviewed.*

*Support:*

- 14 *Interim approval allows interim use, pending official rulemaking, of a new traffic control device, a revision to the application or manner of use of an existing traffic control device, or a provision not specifically described in this Manual. The FHWA issues an Interim Approval by official memorandum signed by the Associate Administrator for Operations and posts this memorandum on the MUTCD website. the issuance by FHWA of an interim approval will typically result in the traffic control device or application being placed into the next scheduled rulemaking process for revisions to this Manual.*
- 15 *Interim approval is considered based on the results of successful experimentation, results of analytical or laboratory studies, and/or review of non-U.S. experience with a traffic control device or application. Interim approval considerations include an assessment of relative risks, benefits, costs, impacts, and other factors.*

- 16 Interim approval allows for optional use of a traffic control device or application and does not create a new mandate or recommendation for use. Interim approval includes conditions that jurisdictions agree to comply with in order to use the traffic control device or application until an official rulemaking action has occurred.

**Standard:**

- 17 **A jurisdiction, toll facility operator, or owner of a private road open to public travel that desires to use a traffic control device for which FHWA has issued an interim approval shall request permission from FHWA.**

*Guidance:*

- 18 *The request for permission to place a traffic control device under an interim approval should contain the following:*
- A. *A description of where the device will be used, such as a list of specific locations or highway segments or types of situations, or a statement of the intent to use the device jurisdiction-wide;*
  - B. *An agreement to abide by the specific conditions for use of the device as contained in the FHWA's interim approval document;*
  - C. *An agreement to maintain and continually update a list of locations where the device has been installed; and*
  - D. *An agreement to:*
    - 1. *Restore the site(s) of the interim approval to a condition that complies with the provisions in this Manual within 3 months following the issuance of a Final Rule on this traffic control device; and*
    - 2. *Terminate use of the device or application installed under the interim approval at any time that it determines significant safety concerns are directly or indirectly attributable to the device or application. The FHWA's Office of Transportation Operations has the right to terminate the interim approval at any time if there is an indication of safety concerns.*

*Option:*

- 19 A State may submit a request for the use of a device under interim approval for all jurisdictions in that State, as long as the request contains the information listed in Paragraph 18.

*Guidance:*

- 20 *A local jurisdiction, toll facility operator, or owner of a private road open to public travel using a traffic control device or application under an interim approval that was granted by FHWA either directly or on a statewide basis based on the State's request should inform the State of the locations of such use.*
- 21 *A local jurisdiction, toll facility operator, or owner of a private road open to public travel that is requesting permission to experiment or permission to use a device or application under an interim approval should first check for any State laws and/or directives covering the application of the MUTCD provisions that might exist in their State.*

*Option:*

- 22 A device or application installed under an interim approval may remain in place, under the conditions established in the interim approval, until an official rulemaking action has occurred.

*Support:*

- 23 A diagram indicating the process for incorporating new traffic control devices into this Manual is shown in Figure 1A-2.
- 24 For additional information concerning interpretations, experimentation, changes, or interim approvals, visit the MUTCD website at <http://mutcd.fhwa.dot.gov>.

## **Section 1A.11 Relation to Other Publications**

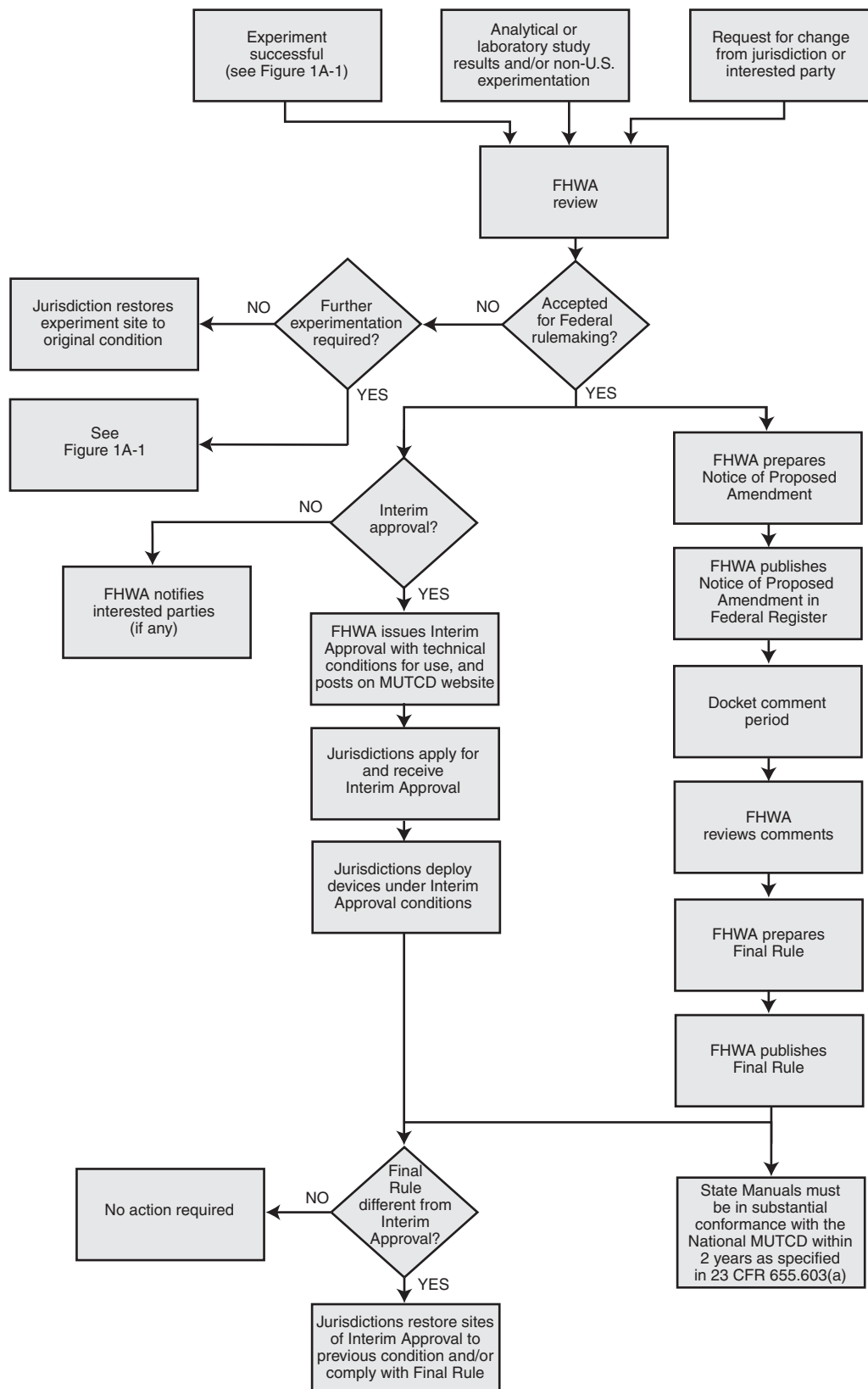
**Standard:**

- 01 **To the extent that they are incorporated by specific reference, the latest editions of the following publications, or those editions specifically noted, shall be a part of this Manual: “Standard Highway Signs and Markings” book (FHWA); and “Color Specifications for Retroreflective Sign and Pavement Marking Materials” (appendix to subpart F of Part 655 of Title 23 of the Code of Federal Regulations).**

*Support:*

- 02 The “Standard Highway Signs and Markings” book includes standard alphabets and symbols and arrows for signs and pavement markings.
- 03 For information about the publications mentioned in Paragraph 1, visit the Federal Highway Administration's MUTCD website at <http://mutcd.fhwa.dot.gov>, or write to the FHWA, 1200 New Jersey Avenue, SE, HOTO, Washington, DC 20590.

**Figure 1A-2. Process for Incorporating New Traffic Control Devices into the MUTCD**



04 Other publications that are useful sources of information with respect to the use of this Manual are listed in this paragraph. See Page i of this Manual for ordering information for the following publications (later editions might also be available as useful sources of information):

1. "AAA School Safety Patrol Operations Manual," 2006 Edition (American Automobile Association—AAA)
2. "A Policy on Geometric Design of Highways and Streets," 2004 Edition (American Association of State Highway and Transportation Officials—AASHTO)
3. "Guide for the Development of Bicycle Facilities," 1999 Edition (AASHTO)
4. "Guide for the Planning, Design, and Operation of Pedestrian Facilities," 2004 Edition (AASHTO)
5. "Guide to Metric Conversion," 1993 Edition (AASHTO)
6. "Guidelines for the Selection of Supplemental Guide Signs for Traffic Generators Adjacent to Freeways," 4th Edition/Guide Signs, Part II: Guidelines for Airport Guide Signing/Guide Signs, Part III: List of Control Cities for Use in Guide Signs on Interstate Highways," Item Code: GSGLC-4, 2001 Edition (AASHTO)
7. "Roadside Design Guide," 2006 Edition (AASHTO)
8. "Standard Specifications for Movable Highway Bridges," 1988 Edition (AASHTO)
9. "Traffic Engineering Metric Conversion Folders—Addendum to the Guide to Metric Conversion," 1993 Edition (AASHTO)
10. "2009 AREMA Communications & Signals Manual," (American Railway Engineering & Maintenance-of-Way Association—AREMA)
11. "Changeable Message Sign Operation and Messaging Handbook (FHWA-OP-03-070)," 2004 Edition (Federal Highway Administration—FHWA)
12. "Designing Sidewalks and Trails for Access—Part 2—Best Practices Design Guide (FHWA-EP-01-027)," 2001 Edition (FHWA)
13. "Federal-Aid Highway Program Guidance on High Occupancy Vehicle (HOV) Lanes," 2001 (FHWA)
14. "Maintaining Traffic Sign Retroreflectivity," 2007 Edition (FHWA)
15. "Railroad-Highway Grade Crossing Handbook—Revised Second Edition (FHWA-SA-07-010)," 2007 Edition (FHWA)
16. "Ramp Management and Control Handbook (FHWA-HOP-06-001)," 2006 Edition (FHWA)
17. "Roundabouts-An Informational Guide (FHWA-RD-00-067)," 2000 Edition (FHWA)
18. "Signal Timing Manual (FHWA-HOP-08-024)," 2008 Edition (FHWA)
19. "Signalized Intersections: an Informational Guide (FHWA-HRT-04-091)," 2004 Edition (FHWA)
20. "Travel Better, Travel Longer: A Pocket Guide to Improving Traffic Control and Mobility for Our Older Population (FHWA-OP-03-098)," 2003 Edition (FHWA)
21. "Practice for Roadway Lighting," RP-8, 2001 (Illuminating Engineering Society—IES)
22. "Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Commercial Electric Detonators (Blasting Caps)," Safety Library Publication No. 20, July 2001 Edition (Institute of Makers of Explosives)
23. "American National Standard for High-Visibility Public Safety Vests," (ANSI/ISEA 207-2006), 2006 Edition (International Safety Equipment Association—ISEA)
24. "American National Standard for High-Visibility Safety Apparel and Headwear," (ANSI/ISEA 107-2004), 2004 Edition (ISEA)
25. "Manual of Traffic Signal Design," 1998 Edition (Institute of Transportation Engineers—ITE)
26. "Manual of Transportation Engineering Studies," 1994 Edition (ITE)
27. "Pedestrian Traffic Control Signal Indications," Part 1—1985 Edition; Part 2 (LED Pedestrian Traffic Signal Modules)—2004 Edition (ITE)
28. "Preemption of Traffic Signals Near Railroad Crossings," 2006 Edition (ITE)
29. "Purchase Specification for Flashing and Steady Burn Warning Lights," 1981 Edition (ITE)
30. "Traffic Control Devices Handbook," 2001 Edition (ITE)
31. "Traffic Detector Handbook," 1991 Edition (ITE)
32. "Traffic Engineering Handbook," 2009 Edition (ITE)
33. "Traffic Signal Lamps," 1980 Edition (ITE)
34. "Vehicle Traffic Control Signal Heads," Part 1—1985 Edition; Part 2 (LED Circular Signal Supplement)—2005 Edition; Part 3 (LED Vehicular Arrow Traffic Signal Supplement)—2004 Edition (ITE)
35. "Uniform Vehicle Code (UVC) and Model Traffic Ordinance," 2000 Edition (National Committee on Uniform Traffic Laws and Ordinances—NCUTLO)
36. "NEMA Standards Publication TS 4-2005 Hardware Standards for Dynamic Message Signs (DMS) With NTCIP Requirements," 2005 Edition (National Electrical Manufacturers Association—NEMA)
37. "Occupational Safety and Health Administration Regulations (Standards - 29 CFR), General Safety and Health Provisions - 1926.20," amended June 30, 1993 (Occupational Safety and Health Administration—OSHA)
38. "Accessible Pedestrian Signals—A Guide to Best Practices (NCHRP Web-Only Document 117A)," 2008 Edition (Transportation Research Board—TRB)

39. "Guidelines for Accessible Pedestrian Signals (NCHRP Web-Only Document 117B)," 2008 Edition (TRB)
40. "Highway Capacity Manual," 2000 Edition (TRB)
41. "Recommended Procedures for the Safety Performance Evaluation of Highway Features," (NCHRP Report 350), 1993 Edition (TRB)
42. "The Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)," July 1998 Edition (The U.S. Access Board)

## Section 1A.12 Color Code

Support:

- 01 The following color code establishes general meanings for 11 colors of a total of 13 colors that have been identified as being appropriate for use in conveying traffic control information. tolerance limits for each color are contained in 23 CFR Part 655, Appendix to Subpart F and are available at the Federal Highway Administration's MUTCD website at <http://mutcd.fhwa.dot.gov> or by writing to the FHWA, Office of Safety Research and Development (HRD-T-301), 6300 Georgetown Pike, McLean, VA 22101.
- 02 The two colors for which general meanings have not yet been assigned are being reserved for future applications that will be determined only by FHWA after consultation with the States, the engineering community, and the general public. The meanings described in this Section are of a general nature. More specific assignments of colors are given in the individual Parts of this Manual relating to each class of devices.

**Standard:**

- 03 **The general meaning of the 13 colors shall be as follows:**
  - A. **Black—regulation**
  - B. **Blue—road user services guidance, tourist information, and evacuation route**
  - C. **Brown—recreational and cultural interest area guidance**
  - D. **Coral—unassigned**
  - E. **Fluorescent Pink—incident management**
  - F. **Fluorescent Yellow-Green—pedestrian warning, bicycle warning, playground warning, school bus and school warning**
  - G. **Green—indicated movements permitted, direction guidance**
  - H. **Light Blue—unassigned**
  - I. **Orange—temporary traffic control**
  - J. **Purple—lanes restricted to use only by vehicles with registered electronic toll collection (ETC) accounts**
  - K. **Red—stop or prohibition**
  - L. **White—regulation**
  - M. **Yellow—warning**

## Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual

**Standard:**

- 01 **When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be defined as follows:**
  - A. **Standard—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All Standard statements are labeled, and the text appears in bold type. The verb "shall" is typically used. The verbs "should" and "may" are not used in Standard statements. Standard statements are sometimes modified by Options. Standard statements shall not be modified or compromised based on engineering judgment or engineering study.**
  - B. **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. The verbs "shall" and "may" are not used in Guidance statements. Guidance statements are sometimes modified by Options.**
  - C. **Option—a statement of practice that is a permissive condition and carries no requirement or recommendation. Option statements sometime contain allowable modifications to a Standard or Guidance statement. All Option statements are labeled, and the text appears in unbold type. The verb "may" is typically used. The verbs "shall" and "should" are not used in Option statements.**
  - D. **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.**



- 02 Unless otherwise defined in this Section, or in other Parts of this Manual, words or phrases shall have the meaning(s) as defined in the most recent editions of the “Uniform Vehicle Code,” “AASHTO Transportation Glossary (Highway Definitions),” and other publications mentioned in Section 1A.11.
- 03 The following words and phrases, when used in this Manual, shall have the following meanings:
1. Accessible Pedestrian Signal—a device that communicates information about pedestrian signal timing in non-visual format such as audible tones, speech messages, and/or vibrating surfaces.
  2. Accessible Pedestrian Signal Detector—a device designated to assist the pedestrian who has visual or physical disabilities in activating the pedestrian phase.
  3. Active Grade Crossing Warning System—the flashing-light signals, with or without warning gates, together with the necessary control equipment used to inform road users of the approach or presence of rail traffic at grade crossings.
  4. Actuated Operation—a type of traffic control signal operation in which some or all signal phases are operated on the basis of actuation.
  5. Actuation—initiation of a change in or extension of a traffic signal phase through the operation of any type of detector.
  6. Advance Preemption—the notification of approaching rail traffic that is forwarded to the highway traffic signal controller unit or assembly by the railroad or light rail transit equipment in advance of the activation of the railroad or light rail transit warning devices.
  7. Advance Preemption Time—the period of time that is the difference between the required maximum highway traffic signal preemption time and the activation of the railroad or light rail transit warning devices.
  8. Advisory Speed—a recommended speed for all vehicles operating on a section of highway and based on the highway design, operating characteristics, and conditions.
  9. Alley—a street or highway intended to provide access to the rear or side of lots or buildings in urban areas and not intended for the purpose of through vehicular traffic.
  10. Altered Speed Zone—a speed limit, other than a statutory speed limit, that is based upon an engineering study.
  11. Approach—all lanes of traffic moving toward an intersection or a midblock location from one direction, including any adjacent parking lane(s).
  12. Arterial Highway (Street)—a general term denoting a highway primarily used by through traffic, usually on a continuous route or a highway designated as part of an arterial system.
  13. Attended Lane (Manual Lane)—a toll lane adjacent to a toll booth occupied by a human toll collector who makes change, issues receipts, and perform other toll-related functions. Attended lanes at toll plazas typically require vehicles to stop to pay the toll.
  14. Automatic Lane—see Exact Change Lane.
  15. Average Annual Daily Traffic (AADT)—the total volume of traffic passing a point or segment of a highway facility in both directions for one year divided by the number of days in the year. Normally, periodic daily traffic volumes are adjusted for hours of the day counted, days of the week, and seasons of the year to arrive at average annual daily traffic.
  16. Average Daily Traffic (ADT)—the average 24 hour volume, being the total volume during a stated period divided by the number of days in that period. Normally, this would be periodic daily traffic volumes over several days, not adjusted for days of the week or seasons of the year.
  17. Average Day—a day representing traffic volumes normally and repeatedly found at a location, typically a weekday when volumes are influenced by employment or a weekend day when volumes are influenced by entertainment or recreation.
  18. Backplate—see Signal Backplate.
  19. Barrier-Separated Lane—a preferential lane or other special purpose lane that is separated from the adjacent general-purpose lane(s) by a physical barrier.
  20. Beacon—a highway traffic signal with one or more signal sections that operates in a flashing mode.
  21. Bicycle—a pedal-powered vehicle upon which the human operator sits.
  22. Bicycle Facilities—a general term denoting improvements and provisions that accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.
  23. Bicycle Lane—a portion of a roadway that has been designated for preferential or exclusive use by bicyclists by pavement markings and, if used, signs.
  24. Bikeway—a generic term for any road, street, path, or way that in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

25. **Buffer-Separated Lane**—a preferential lane or other special purpose lane that is separated from the adjacent general-purpose lane(s) by a pattern of standard longitudinal pavement markings that is wider than a normal or wide lane line marking. The buffer area might include rumble strips, textured pavement, or channelizing devices such as tubular markers or traversable curbs, but does not include a physical barrier.
26. **Cantilevered Signal Structure**—a structure, also referred to as a mast arm, that is rigidly attached to a vertical pole and is used to provide overhead support of highway traffic signal faces or grade crossing signal units.
27. **Center Line Markings**—the yellow pavement marking line(s) that delineates the separation of traffic lanes that have opposite directions of travel on a roadway. These markings need not be at the geometrical center of the pavement.
28. **Changeable Message Sign**—a sign that is capable of displaying more than one message (one of which might be a “blank” display), changeable manually, by remote control, or by automatic control. Electronic-display changeable message signs are referred to as Dynamic Message Signs in the National Intelligent Transportation Systems (ITS) Architecture and are referred to as Variable Message Signs in the National Electrical Manufacturers Association (NEMA) standards publication.
29. **Channelizing Line Markings**—a wide or double solid white line used to form islands where traffic in the same direction of travel is permitted on both sides of the island.
30. **Circular Intersection**—an intersection that has an island, generally circular in design, located in the center of the intersection where traffic passes to the right of the island. Circular intersections include roundabouts, rotaries, and traffic circles.
31. **Circulatory Roadway**—the roadway within a circular intersection on which traffic travels in a counterclockwise direction around an island in the center of the circular intersection.
32. **Clear Storage Distance**—when used in Part 8, the distance available for vehicle storage measured between 6 feet from the rail nearest the intersection to the intersection stop line or the normal stopping point on the highway. At skewed grade crossings and intersections, the 6-foot distance shall be measured perpendicular to the nearest rail either along the center line or edge line of the highway, as appropriate, to obtain the shorter distance. Where exit gates are used, the distance available for vehicle storage is measured from the point where the rear of the vehicle would be clear of the exit gate arm. In cases where the exit gate arm is parallel to the track(s) and is not perpendicular to the highway, the distance is measured either along the center line or edge line of the highway, as appropriate, to obtain the shorter distance.
33. **Clear Zone**—the total roadside border area, starting at the edge of the traveled way, that is available for an errant driver to stop or regain control of a vehicle. This area might consist of a shoulder, a recoverable slope, and/or a non-recoverable, traversable slope with a clear run-out area at its toe.
34. **Collector Highway**—a term denoting a highway that in rural areas connects small towns and local highways to arterial highways, and in urban areas provides land access and traffic circulation within residential, commercial, and business areas and connects local highways to the arterial highways.
35. **Concurrent Flow Preferential Lane**—a preferential lane that is operated in the same direction as the adjacent mixed flow lanes, separated from the adjacent general-purpose freeway lanes by a standard lane stripe, painted buffer, or barrier.
36. **Conflict Monitor**—a device used to detect and respond to improper or conflicting signal indications and improper operating voltages in a traffic controller assembly.
37. **Constant Warning Time Detection**—a means of detecting rail traffic that provides relatively uniform warning time for the approach of trains or light rail transit traffic that are not accelerating or decelerating after being detected.
38. **Contiguous Lane**—a lane, preferential or otherwise, that is separated from the adjacent lane(s) only by a normal or wide lane line marking.
39. **Controller Assembly**—a complete electrical device mounted in a cabinet for controlling the operation of a highway traffic signal.
40. **Controller Unit**—that part of a controller assembly that is devoted to the selection and timing of the display of signal indications.
41. **Conventional Road**—a street or highway other than a low-volume road (as defined in Section 5A.01), expressway, or freeway.
42. **Counter-Flow Lane**—a lane operating in a direction opposite to the normal flow of traffic designated for peak direction of travel during at least a portion of the day. Counter-flow lanes are usually separated from the off-peak direction lanes by tubular markers or other flexible channelizing devices, temporary lane separators, or movable or permanent barrier.

43. **Crashworthy**—a characteristic of a roadside appurtenance that has been successfully crash tested in accordance with a national standard such as the National Cooperative Highway Research Program Report 350, “Recommended Procedures for the Safety Performance Evaluation of Highway Features.”
44. **Crosswalk**—(a) that part of a roadway at an intersection included within the connections of the lateral lines of the sidewalks on opposite sides of the highway measured from the curbs or in the absence of curbs, from the edges of the traversable roadway, and in the absence of a sidewalk on one side of the roadway, the part of a roadway included within the extension of the lateral lines of the sidewalk at right angles to the center line; (b) any portion of a roadway at an intersection or elsewhere distinctly indicated as a pedestrian crossing by pavement marking lines on the surface, which might be supplemented by contrasting pavement texture, style, or color.
45. **Crosswalk Lines**—white pavement marking lines that identify a crosswalk.
46. **Cycle Length**—the time required for one complete sequence of signal indications.
47. **Dark Mode**—the lack of all signal indications at a signalized location. (The dark mode is most commonly associated with power failures, ramp meters, hybrid beacons, beacons, and some movable bridge signals.)
48. **Delineator**—a retroreflective device mounted on the roadway surface or at the side of the roadway in a series to indicate the alignment of the roadway, especially at night or in adverse weather.
49. **Design Vehicle**—the longest vehicle permitted by statute of the road authority (State or other) on that roadway.
50. **Designated Bicycle Route**—a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route signs, with or without specific bicycle route numbers.
51. **Detectable**—having a continuous edge within 6 inches of the surface so that pedestrians who have visual disabilities can sense its presence and receive usable guidance information.
52. **Detector**—a device used for determining the presence or passage of vehicles or pedestrians.
53. **Downstream**—a term that refers to a location that is encountered by traffic subsequent to an upstream location as it flows in an “upstream to downstream” direction. For example, “the downstream end of a lane line separating the turn lane from a through lane on the approach to an intersection” is the end of the lane line that is closest to the intersection.
54. **Dropped Lane**—a through lane that becomes a mandatory turn lane on a conventional roadway, or a through lane that becomes a mandatory exit lane on a freeway or expressway. The end of an acceleration lane and reductions in the number of through lanes that do not involve a mandatory turn or exit are not considered dropped lanes.
55. **Dual-Arrow Signal Section**—a type of signal section designed to include both a yellow arrow and a green arrow.
56. **Dynamic Envelope**—the clearance required for light rail transit traffic or a train and its cargo overhang due to any combination of loading, lateral motion, or suspension failure (see Figure 8B-8).
57. **Dynamic Exit Gate Operating Mode**—a mode of operation where the exit gate operation is based on the presence of vehicles within the minimum track clearance distance.
58. **Edge Line Markings**—white or yellow pavement marking lines that delineate the right or left edge(s) of a traveled way.
59. **Electronic Toll Collection (ETC)**—a system for automated collection of tolls from moving or stopped vehicles through wireless technologies such as radio-frequency communication or optical scanning. ETC systems are classified as one of the following: (1) systems that require users to have registered toll accounts, with the use of equipment inside or on the exterior of vehicles, such as a transponder or barcode decal, that communicates with or is detected by roadside or overhead receiving equipment, or with the use of license plate optical scanning, to automatically deduct the toll from the registered user account, or (2) systems that do not require users to have registered toll accounts because vehicle license plates are optically scanned and invoices for the toll amount are sent through postal mail to the address of the vehicle owner.
60. **Electronic Toll Collection (ETC) Account-Only Lane**—a non-attended toll lane that is restricted to use only by vehicles with a registered toll payment account.
61. **Emergency-Vehicle Hybrid Beacon**—a special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist authorized emergency vehicles in entering or crossing a street or highway.
62. **Emergency-Vehicle Traffic Control Signal**—a special traffic control signal that assigns the right-of-way to an authorized emergency vehicle.
63. **End-of-Roadway Marker**—a device used to warn and alert road users of the end of a roadway in other than temporary traffic control zones.

64. **Engineering Judgment**—the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgment is not required.
65. **Engineering Study**—the comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.
66. **Entrance Gate**—an automatic gate that can be lowered across the lanes approaching a grade crossing to block road users from entering the grade crossing.
67. **Exact Change Lane (Automatic Lane)**—a non-attended toll lane that has a receptacle into which road users deposit coins totaling the exact amount of the toll. Exact Change lanes at toll plazas typically require vehicles to stop to pay the toll.
68. **Exit Gate**—an automatic gate that can be lowered across the lanes departing a grade crossing to block road users from entering the grade crossing by driving in the opposing traffic lanes.
69. **Exit Gate Clearance Time**—for Four-Quadrant Gate systems at grade crossings, the amount of time provided to delay the descent of the exit gate arm(s) after entrance gate arm(s) begin to descend.
70. **Exit Gate Operating Mode**—for Four-Quadrant Gate systems at grade crossings, the mode of control used to govern the operation of the exit gate arms.
71. **Expressway**—a divided highway with partial control of access.
72. **Flagger**—a person who actively controls the flow of vehicular traffic into and/or through a temporary traffic control zone using hand-signaling devices or an Automated Flagger Assistance Device (AFAD).
73. **Flasher**—a device used to turn highway traffic signal indications on and off at a repetitive rate of approximately once per second.
74. **Flashing**—an operation in which a light source, such as a traffic signal indication, is turned on and off repetitively.
75. **Flashing-Light Signals**—a warning device consisting of two red signal indications arranged horizontally that are activated to flash alternately when rail traffic is approaching or present at a grade crossing.
76. **Flashing Mode**—a mode of operation in which at least one traffic signal indication in each vehicular signal face of a highway traffic signal is turned on and off repetitively.
77. **Freeway**—a divided highway with full control of access.
78. **Full-Actuated Operation**—a type of traffic control signal operation in which all signal phases function on the basis of actuation.
79. **Gate**—an automatically-operated or manually-operated traffic control device that is used to physically obstruct road users such that they are discouraged from proceeding past a particular point on a roadway or pathway, or such that they are discouraged from entering a particular grade crossing, ramp, lane, roadway, or facility.
80. **Grade Crossing**—the general area where a highway and a railroad and/or light rail transit route cross at the same level, within which are included the tracks, highway, and traffic control devices for traffic traversing that area.
81. **Guide Sign**—a sign that shows route designations, destinations, directions, distances, services, points of interest, or other geographical, recreational, or cultural information.
82. **High-Occupancy Vehicle (HOV)**—a motor vehicle carrying at least two or more persons, including carpools, vanpools, and buses.
83. **Highway**—a general term for denoting a public way for purposes of vehicular travel, including the entire area within the right-of-way.
84. **Highway-Light Rail Transit Grade Crossing**—the general area where a highway and a light rail transit route cross at the same level, within which are included the light rail transit tracks, highway, and traffic control devices for traffic traversing that area.
85. **Highway-Rail Grade Crossing**—the general area where a highway and a railroad cross at the same level, within which are included the railroad tracks, highway, and traffic control devices for highway traffic traversing that area.



86. **Highway Traffic Signal**—a power-operated traffic control device by which traffic is warned or directed to take some specific action. These devices do not include power-operated signs, steadily-illuminated pavement markers, warning lights (see Section 6F.83), or steady burning electric lamps.
87. **HOV Lane**—any preferential lane designated for exclusive use by high-occupancy vehicles for all or part of a day—including a designated lane on a freeway, other highway, street, or independent roadway on a separate right-of-way.
88. **Hybrid Beacon**—a special type of beacon that is intentionally placed in a dark mode (no indications displayed) between periods of operation and, when operated, displays both steady and flashing traffic control signal indications.
89. **Inherently Low Emission Vehicle (ILEV)**—any kind of vehicle that, because of inherent properties of the fuel system design, will not have significant evaporative emissions, even if its evaporative emission control system has failed.
90. **In-Roadway Lights**—a special type of highway traffic signal installed in the roadway surface to warn road users that they are approaching a condition on or adjacent to the roadway that might not be readily apparent and might require the road users to slow down and/or come to a stop.
91. **Interchange**—a system of interconnecting roadways providing for traffic movement between two or more highways that do not intersect at grade.
92. **Interconnection**—when used in Part 8, the electrical connection between the railroad or light rail transit active warning system and the highway traffic signal controller assembly for the purpose of preemption.
93. **Intermediate Interchange**—an interchange with an urban or rural route that is not a major or minor interchange as defined in this Section.
94. **Intersection**—intersection is defined as follows:
  - (a) The area embraced within the prolongation or connection of the lateral curb lines, or if none, the lateral boundary lines of the roadways of two highways that join one another at, or approximately at, right angles, or the area within which vehicles traveling on different highways that join at any other angle might come into conflict.
  - (b) The junction of an alley or driveway with a roadway or highway shall not constitute an intersection, unless the roadway or highway at said junction is controlled by a traffic control device.
  - (c) If a highway includes two roadways that are 30 feet or more apart (see definition of Median), then every crossing of each roadway of such divided highway by an intersecting highway shall be a separate intersection.
  - (d) If both intersecting highways include two roadways that are 30 feet or more apart, then every crossing of any two roadways of such highways shall be a separate intersection.
  - (e) At a location controlled by a traffic control signal, regardless of the distance between the separate intersections as defined in (c) and (d) above:
    - (1) If a stop line, yield line, or crosswalk has not been designated on the roadway (within the median) between the separate intersections, the two intersections and the roadway (median) between them shall be considered as one intersection;
    - (2) Where a stop line, yield line, or crosswalk is designated on the roadway on the intersection approach, the area within the crosswalk and/or beyond the designated stop line or yield line shall be part of the intersection; and
    - (3) Where a crosswalk is designated on a roadway on the departure from the intersection, the intersection shall include the area extending to the far side of such crosswalk.
95. **Intersection Control Beacon**—a beacon used only at an intersection to control two or more directions of travel.
96. **Interval**—the part of a signal cycle during which signal indications do not change.
97. **Interval Sequence**—the order of appearance of signal indications during successive intervals of a signal cycle.
98. **Island**—a defined area between traffic lanes for control of vehicular movements, for toll collection, or for pedestrian refuge. It includes all end protection and approach treatments. Within an intersection area, a median or an outer separation is considered to be an island.
99. **Lane Drop**—see **Dropped Lane**.
100. **Lane Line Markings**—white pavement marking lines that delineate the separation of traffic lanes that have the same direction of travel on a roadway.
101. **Lane-Use Control Signal**—a signal face displaying indications to permit or prohibit the use of specific lanes of a roadway or to indicate the impending prohibition of such use.



- 102. **Legend**—see Sign Legend.
- 103. **Lens**—see Signal Lens.
- 104. **Light Rail Transit Traffic** **Light Rail Transit Equipment**—every device in, upon, or by which any person or property can be transported on light rail transit tracks, including single-unit light rail transit cars (such as streetcars and trolleys) and assemblies of multiple light rail transit cars coupled together.
- 105. **Locomotive Horn**—an air horn, steam whistle, or similar audible warning device (see 49 CFR Part 229.129) mounted on a locomotive or control cab car. The terms “locomotive horn,” “train whistle,” “locomotive whistle,” and “train horn” are used interchangeably in the railroad industry.
- 106. **Logo**—a distinctive emblem or trademark that identifies a commercial business and/or the product or service offered by the business.
- 107. **Longitudinal Markings**—pavement markings that are generally placed parallel and adjacent to the flow of traffic such as lane lines, center lines, edge lines, channelizing lines, and others.
- 108. **Louver**—see Signal Louver.
- 109. **Major Interchange**—an interchange with another freeway or expressway, or an interchange with a high-volume multi-lane highway, principal urban arterial, or major rural route where the interchanging traffic is heavy or includes many road users unfamiliar with the area.
- 110. **Major Street**—the street normally carrying the higher volume of vehicular traffic.
- 111. **Malfunction Management Unit**—same as Conflict Monitor.
- 112. **Managed Lane**—a highway lane or set of lanes, or a highway facility, for which variable operational strategies such as direction of travel, tolling, pricing, and/or vehicle type or occupancy requirements are implemented and managed in real-time in response to changing conditions. Managed lanes are typically buffer- or barrier-separated lanes parallel to the general-purpose lanes of a highway in which access is restricted to designated locations. There are also some highways on which all lanes are managed.
- 113. **Manual Lane**—see Attended Lane.
- 114. **Maximum Highway Traffic Signal Preemption Time**—the maximum amount of time needed following initiation of the preemption sequence for the highway traffic signals to complete the timing of the right-of-way transfer time, queue clearance time, and separation time.
- 115. **Median**—the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges, and at opposite approaches of the same intersection.
- 116. **Minimum Track Clearance Distance**—for standard two-quadrant warning devices, the minimum track clearance distance is the length along a highway at one or more railroad or light rail transit tracks, measured from the highway stop line, warning device, or 12 feet perpendicular to the track center line, to 6 feet beyond the track(s) measured perpendicular to the far rail, along the center line or edge line of the highway, as appropriate, to obtain the longer distance. For Four-Quadrant Gate systems, the minimum track clearance distance is the length along a highway at one or more railroad or light rail transit tracks, measured either from the highway stop line or entrance warning device, to the point where the rear of the vehicle would be clear of the exit gate arm. In cases where the exit gate arm is parallel to the track(s) and is not perpendicular to the highway, the distance is measured either along the center line or edge line of the highway, as appropriate, to obtain the longer distance.
- 117. **Minimum Warning Time**—when used in Part 8, the least amount of time active warning devices shall operate prior to the arrival of rail traffic at a grade crossing.
- 118. **Minor Interchange**—an interchange where traffic is local and very light, such as interchanges with land service access roads. Where the sum of the exit volumes is estimated to be lower than 100 vehicles per day in the design year, the interchange is classified as local.
- 119. **Minor Street**—the street normally carrying the lower volume of vehicular traffic.
- 120. **Movable Bridge Resistance Gate**—a type of traffic gate, which is located downstream of the movable bridge warning gate, that provides a physical deterrent to vehicle and/or pedestrian traffic when placed in the appropriate position.
- 121. **Movable Bridge Signal**—a highway traffic signal installed at a movable bridge to notify traffic to stop during periods when the roadway is closed to allow the bridge to open.
- 122. **Movable Bridge Warning Gate**—a type of traffic gate designed to warn, but not primarily to block, vehicle and/or pedestrian traffic when placed in the appropriate position.
- 123. **Multi-Lane**—more than one lane moving in the same direction. A multi-lane street, highway, or roadway has a basic cross-section comprised of two or more through lanes in one or both directions. A multi-lane approach has two or more lanes moving toward the intersection, including turning lanes.

124. **Neutral Area**—the paved area between the channelizing lines separating an entrance or exit ramp or a channelized turn lane or channelized entering lane from the adjacent through lane(s).
125. **Object Marker**—a device used to mark obstructions within or adjacent to the roadway.
126. **Occupancy Requirement**—any restriction that regulates the use of a facility or one or more lanes of a facility for any period of the day based on a specified number of persons in a vehicle.
127. **Occupant**—a person driving or riding in a car, truck, bus, or other vehicle.
128. **Open-Road ETC Lane**—a non-attended lane that is designed to allow toll payments to be electronically collected from vehicles traveling at normal highway speeds. Open-Road ETC lanes are typically physically separated from the toll plaza, often following the alignment of the mainline lanes, with toll plaza lanes for cash toll payments being on a different alignment after diverging from the mainline lanes or a subset thereof.
129. **Open-Road Tolling**—a system designed to allow electronic toll collection (ETC) from vehicles traveling at normal highway speeds. Open-Road Tolling might be used on toll roads or toll facilities in conjunction with toll plazas. Open-Road Tolling is also typically used on managed lanes and on toll facilities that only accept payment by ETC.
130. **Open-Road Tolling Point**—the location along an Open-Road ETC lane at which roadside or overhead detection and receiving equipment are placed and vehicles are electronically assessed a toll.
131. **Opposing Traffic**—vehicles that are traveling in the opposite direction. At an intersection, vehicles entering from an approach that is approximately straight ahead would be considered to be opposing traffic, but vehicles entering from approaches on the left or right would not be considered to be opposing traffic.
132. **Overhead Sign**—a sign that is placed such that a portion or the entirety of the sign or its support is directly above the roadway or shoulder such that vehicles travel below it. Typical installations include signs placed on cantilever arms that extend over the roadway or shoulder, on sign support structures that span the entire width of the pavement, on mast arms or span wires that also support traffic control signals, and on highway bridges that cross over the roadway.
133. **Parking Area**—a parking lot or parking garage that is separated from a roadway. Parallel or angle parking spaces along a roadway are not considered a parking area.
134. **Passive Grade Crossing**—a grade crossing where none of the automatic traffic control devices associated with an Active Grade Crossing Warning System are present and at which the traffic control devices consist entirely of signs and/or markings.
135. **Pathway**—a general term denoting a public way for purposes of travel by authorized users outside the traveled way and physically separated from the roadway by an open space or barrier and either within the highway right-of-way or within an independent alignment. Pathways include shared-use paths, but do not include sidewalks.
136. **Pathway Grade Crossing**—the general area where a pathway and railroad or light rail transit tracks cross at the same level, within which are included the tracks, pathway, and traffic control devices for pathway traffic traversing that area.
137. **Paved**—a bituminous surface treatment, mixed bituminous concrete, or Portland cement concrete roadway surface that has both a structural (weight bearing) and a sealing purpose for the roadway.
138. **Pedestrian**—a person on foot, in a wheelchair, on skates, or on a skateboard.
139. **Pedestrian Change Interval**—an interval during which the flashing UPRAISED HAND (symbolizing DONT WALK) signal indication is displayed.
140. **Pedestrian Clearance Time**—the time provided for a pedestrian crossing in a crosswalk, after leaving the curb or shoulder, to travel to the far side of the traveled way or to a median.
141. **Pedestrian Facilities**—a general term denoting improvements and provisions made to accommodate or encourage walking.
142. **Pedestrian Hybrid Beacon**—a special type of hybrid beacon used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk.
143. **Pedestrian Signal Head**—a signal head, which contains the symbols WALKING PERSON (symbolizing WALK) and UPRAISED HAND (symbolizing DONT WALK), that is installed to direct pedestrian traffic at a traffic control signal.
144. **Permissive Mode**—a mode of traffic control signal operation in which left or right turns are permitted to be made after yielding to pedestrians, if any, and/or opposing traffic, if any. When a CIRCULAR GREEN signal indication is displayed, both left and right turns are permitted unless otherwise prohibited by another traffic control device. When a flashing YELLOW ARROW or flashing RED ARROW signal indication is displayed, the turn indicated by the arrow is permitted.

145. **Physical Gore**—a longitudinal point where a physical barrier or the lack of a paved surface inhibits road users from crossing from a ramp or channelized turn lane or channelized entering lane to the adjacent through lane(s) or vice versa.
146. **Pictograph**—a pictorial representation used to identify a governmental jurisdiction, an area of jurisdiction, a governmental agency, a military base or branch of service, a governmental-approved university or college, a toll payment system, or a government-approved institution.
147. **Plaque**—a traffic control device intended to communicate specific information to road users through a word, symbol, or arrow legend that is placed immediately adjacent to a sign to supplement the message on the sign. The difference between a plaque and a sign is that a plaque cannot be used alone. The designation for a plaque includes a “P” suffix.
148. **Platoon**—a group of vehicles or pedestrians traveling together as a group, either voluntarily or involuntarily, because of traffic signal controls, geometrics, or other factors.
149. **Portable Traffic Control Signal**—a temporary traffic control signal that is designed so that it can be easily transported and reused at different locations.
150. **Post-Mounted Sign**—a sign that is placed to the side of the roadway such that no portion of the sign or its support is directly above the roadway or shoulder.
151. **Posted Speed Limit**—a speed limit determined by law or regulation and displayed on Speed Limit signs.
152. **Preemption**—the transfer of normal operation of a traffic control signal to a special control mode of operation.
153. **Preferential Lane**—a highway lane reserved for the exclusive use of one or more specific types of vehicles or vehicles with at least a specific number of occupants.
154. **Pre-Signal**—traffic control signal faces that control traffic approaching a grade crossing in conjunction with the traffic control signal faces that control traffic approaching a highway-highway intersection beyond the tracks. Supplemental near-side traffic control signal faces for the highway-highway intersection are not considered pre-signals. Pre-signals are typically used where the clear storage distance is insufficient to store one or more design vehicles.
155. **Pretimed Operation**—a type of traffic control signal operation in which none of the signal phases function on the basis of actuation.
156. **Primary Signal Face**—one of the required or recommended minimum number of signal faces for a given approach or separate turning movement, but not including near-side signal faces required as a result of the far-side signal faces exceeding the maximum distance from the stop line.
157. **Principal Legend**—place names, street names, and route numbers placed on guide signs.
158. **Priority Control**—a means by which the assignment of right-of-way is obtained or modified.
159. **Private Road Open to Public Travel**—private toll roads and roads (including any adjacent sidewalks that generally run parallel to the road) within shopping centers, airports, sports arenas, and other similar business and/or recreation facilities that are privately owned, but where the public is allowed to travel without access restrictions. Roads within private gated properties (except for gated toll roads) where access is restricted at all times, parking areas, driving aisles within parking areas, and private grade crossings shall not be included in this definition.
160. **Protected Mode**—a mode of traffic control signal operation in which left or right turns are permitted to be made when a left or right GREEN ARROW signal indication is displayed.
161. **Public Road**—any road, street, or similar facility under the jurisdiction of and maintained by a public agency and open to public travel.
162. **Pushbutton**—a button to activate a device or signal timing for pedestrians, bicyclists, or other road users.
163. **Pushbutton Information Message**—a recorded message that can be actuated by pressing a pushbutton when the walk interval is not timing and that provides the name of the street that the crosswalk associated with that particular pushbutton crosses and can also provide other information about the intersection signalization or geometry.
164. **Pushbutton Locator Tone**—a repeating sound that informs approaching pedestrians that a pushbutton exists to actuate pedestrian timing or receive additional information and that enables pedestrians who have visual disabilities to locate the pushbutton.
165. **Queue Clearance Time**—when used in Part 8, the time required for the design vehicle of maximum length stopped just inside the minimum track clearance distance to start up and move through and clear the entire minimum track clearance distance. If pre-signals are present, this time shall be long enough to allow the vehicle to move through the intersection, or to clear the tracks if there is sufficient clear storage distance. If a Four-Quadrant Gate system is present, this time shall be long enough to permit the exit gate arm to lower after the design vehicle is clear of the minimum track clearance distance.

166. **Quiet Zone**—a segment of a rail line, with one or a number of consecutive public highway-rail grade crossings at which locomotive horns are not routinely sounded per 49 CFR Part 222.
167. **Rail Traffic**—every device in, upon, or by which any person or property can be transported on rails or tracks and to which all other traffic must yield the right-of-way by law at grade crossings, including trains, one or more locomotives coupled (with or without cars), other railroad equipment, and light rail transit operating in exclusive or semi-exclusive alignments. Light rail transit operating in a mixed-use alignment, to which other traffic is not required to yield the right-of-way by law, is a vehicle and is not considered to be rail traffic.
168. **Raised Pavement Marker**—a device mounted on or in a road surface that has a height generally not exceeding approximately 1 inch above the road surface for a permanent marker, or not exceeding approximately 2 inches above the road surface for a temporary flexible marker, and that is intended to be used as a positioning guide and/or to supplement or substitute for pavement markings.
169. **Ramp Control Signal**—a highway traffic signal installed to control the flow of traffic onto a freeway at an entrance ramp or at a freeway-to-freeway ramp connection.
170. **Ramp Meter**—see Ramp Control Signal.
171. **Red Clearance Interval**—an interval that follows a yellow change interval and precedes the next conflicting green interval.
172. **Regulatory Sign**—a sign that gives notice to road users of traffic laws or regulations.
173. **Retroreflectivity**—a property of a surface that allows a large portion of the light coming from a point source to be returned directly back to a point near its origin.
174. **Right-of-Way [Assignment]**—the permitting of vehicles and/or pedestrians to proceed in a lawful manner in preference to other vehicles or pedestrians by the display of a sign or signal indications.
175. **Right-of-Way Transfer Time**—when used in Part 8, the maximum amount of time needed for the worst case condition, prior to display of the track clearance green interval. This includes any railroad or light rail transit or highway traffic signal control equipment time to react to a preemption call, and any traffic control signal green, pedestrian walk and clearance, yellow change, and red clearance intervals for conflicting traffic.
176. **Road**—see Roadway.
177. **Road User**—a vehicle operator, bicyclist, or pedestrian, including persons with disabilities, within the highway or on a private road open to public travel.
178. **Roadway**—that portion of a highway improved, designed, or ordinarily used for vehicular travel and parking lanes, but exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by persons riding bicycles or other human-powered vehicles. In the event a highway includes two or more separate roadways, the term roadway as used in this Manual shall refer to any such roadway separately, but not to all such roadways collectively.
179. **Roadway Network**—a geographical arrangement of intersecting roadways.
180. **Roundabout**—a circular intersection with yield control at entry, which permits a vehicle on the circulatory roadway to proceed, and with deflection of the approaching vehicle counter-clockwise around a central island.
181. **Rumble Strip**—a series of intermittent, narrow, transverse areas of rough-textured, slightly raised, or depressed road surface that extend across the travel lane to alert road users to unusual traffic conditions or are located along the shoulder, along the roadway center line, or within islands formed by pavement markings to alert road users that they are leaving the travel lanes.
182. **Rural Highway**—a type of roadway normally characterized by lower volumes, higher speeds, fewer turning conflicts, and less conflict with pedestrians.
183. **Safe-Positioned**—the positioning of emergency vehicles at an incident in a manner that attempts to protect both the responders performing their duties and road users traveling through the incident scene, while minimizing, to the extent practical, disruption of the adjacent traffic flow.
184. **School**—a public or private educational institution recognized by the State education authority for one or more grades K through 12 or as otherwise defined by the State.
185. **School Zone**—a designated roadway segment approaching, adjacent to, and beyond school buildings or grounds, or along which school related activities occur.
186. **Semi-Actuated Operation**—a type of traffic control signal operation in which at least one, but not all, signal phases function on the basis of actuation.
187. **Separate Turn Signal Face**—a signal face that exclusively controls a turn movement and that displays signal indications that are applicable only to the turn movement.
188. **Separation Time**—the component of maximum highway traffic signal preemption time during which the minimum track clearance distance is clear of vehicular traffic prior to the arrival of rail traffic.



189. **Shared Roadway**—a roadway that is officially designated and marked as a bicycle route, but which is open to motor vehicle travel and upon which no bicycle lane is designated.
190. **Shared Turn Signal Face**—a signal face, for controlling both a turn movement and the adjacent through movement, that always displays the same color of circular signal indication that the adjacent through signal face or faces display.
191. **Shared-Use Path**—a bikeway outside the traveled way and physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent alignment. Shared-use paths are also used by pedestrians (including skaters, users of manual and motorized wheelchairs, and joggers) and other authorized motorized and non-motorized users.
192. **Sidewalk**—that portion of a street between the curb line, or the lateral line of a roadway, and the adjacent property line or on easements of private property that is paved or improved and intended for use by pedestrians.
193. **Sign**—any traffic control device that is intended to communicate specific information to road users through a word, symbol, and/or arrow legend. Signs do not include highway traffic signals, pavement markings, delineators, or channelization devices.
194. **Sign Assembly**—a group of signs, located on the same support(s), that supplement one another in conveying information to road users.
195. **Sign Illumination**—either internal or external lighting that shows similar color by day or night. Street or highway lighting shall not be considered as meeting this definition.
196. **Sign Legend**—all word messages, logos, pictographs, and symbol and arrow designs that are intended to convey specific meanings. The border, if any, on a sign is not considered to be a part of the legend.
197. **Sign Panel**—a separate panel or piece of material containing a word, symbol, and/or arrow legend that is affixed to the face of a sign.
198. **Signal Backplate**—a thin strip of material that extends outward from and parallel to a signal face on all sides of a signal housing to provide a background for improved visibility of the signal indications.
199. **Signal Coordination**—the establishment of timed relationships between adjacent traffic control signals.
200. **Signal Face**—an assembly of one or more signal sections that is provided for controlling one or more traffic movements on a single approach.
201. **Signal Head**—an assembly of one or more signal faces that is provided for controlling traffic movements on one or more approaches.
202. **Signal Housing**—that part of a signal section that protects the light source and other required components.
203. **Signal Indication**—the illumination of a signal lens or equivalent device.
204. **Signal Lens**—that part of the signal section that redirects the light coming directly from the light source and its reflector, if any.
205. **Signal Louver**—a device that can be mounted inside a signal visor to restrict visibility of a signal indication from the side or to limit the visibility of the signal indication to a certain lane or lanes, or to a certain distance from the stop line.
206. **Signal Phase**—the right-of-way, yellow change, and red clearance intervals in a cycle that are assigned to an independent traffic movement or combination of movements.
207. **Signal Section**—the assembly of a signal housing, signal lens, if any, and light source with necessary components to be used for displaying one signal indication.
208. **Signal System**—two or more traffic control signals operating in signal coordination.
209. **Signal Timing**—the amount of time allocated for the display of a signal indication.
210. **Signal Visor**—that part of a signal section that directs the signal indication specifically to approaching traffic and reduces the effect of direct external light entering the signal lens.
211. **Signing**—individual signs or a group of signs, not necessarily on the same support(s), that supplement one another in conveying information to road users.
212. **Simultaneous Preemption**—notification of approaching rail traffic forwarded to the highway traffic signal controller unit or assembly and railroad or light rail transit active warning devices at the same time.
213. **Special Purpose Road**—a low-volume, low-speed road that serves recreational areas or resource development activities.



- 214. Speed**—speed is defined based on the following classifications:
- (a) **Average Speed**—the summation of the instantaneous or spot-measured speeds at a specific location of vehicles divided by the number of vehicles observed.
  - (b) **Design Speed**—a selected speed used to determine the various geometric design features of a roadway.
  - (c) **85th-Percentile Speed**—the speed at or below which 85 percent of the motor vehicles travel.
  - (d) **Operating Speed**—a speed at which a typical vehicle or the overall traffic operates. Operating speed might be defined with speed values such as the average, pace, or 85th-percentile speeds.
  - (e) **Pace**—the 10 mph speed range representing the speeds of the largest percentage of vehicles in the traffic stream.
- 215. Speed Limit**—the maximum (or minimum) speed applicable to a section of highway as established by law or regulation.
- 216. Speed Limit Sign Beacon**—a beacon used to supplement a SPEED LIMIT sign.
- 217. Speed Measurement Markings**—a white transverse pavement marking placed on the roadway to assist the enforcement of speed regulations.
- 218. Speed Zone**—a section of highway with a speed limit that is established by law or regulation, but which might be different from a legislatively specified statutory speed limit.
- 219. Splitter Island**—a median island used to separate opposing directions of traffic entering and exiting a roundabout.
- 220. Station Crossing**—a pathway grade crossing that is associated with a station platform.
- 221. Statutory Speed Limit**—a speed limit established by legislative action that typically is applicable for a particular class of highways with specified design, functional, jurisdictional and/or location characteristics and that is not necessarily displayed on Speed Limit signs.
- 222. Steady (Steady Mode)**—the continuous display of a signal indication for the duration of an interval, signal phase, or consecutive signal phases.
- 223. Stop Beacon**—a beacon used to supplement a STOP sign, a DO NOT ENTER sign, or a WRONG WAY sign.
- 224. Stop Line**—a solid white pavement marking line extending across approach lanes to indicate the point at which a stop is intended or required to be made.
- 225. Street**—see Highway.
- 226. Supplemental Signal Face**—a signal face that is not a primary signal face but which is provided for a given approach or separate turning movement to enhance visibility or conspicuity.
- 227. Symbol**—the approved design of a pictorial representation of a specific traffic control message for signs, pavement markings, traffic control signals, or other traffic control devices, as shown in the MUTCD.
- 228. Temporary Traffic Control Signal**—a traffic control signal that is installed for a limited time period.
- 229. Temporary Traffic Control Zone**—an area of a highway where road user conditions are changed because of a work zone or incident by the use of temporary traffic control devices, flaggers, uniformed law enforcement officers, or other authorized personnel.
- 230. Theoretical Gore**—a longitudinal point at the upstream end of a neutral area at an exit ramp or channelized turn lane where the channelizing lines that separate the ramp or channelized turn lane from the adjacent through lane(s) begin to diverge, or a longitudinal point at the downstream end of a neutral area at an entrance ramp or channelized entering lane where the channelizing lines that separate the ramp or channelized entering lane from the adjacent through lane(s) intersect each other.
- 231. Timed Exit Gate Operating Mode**—a mode of operation where the exit gate descent at a grade crossing is based on a predetermined time interval.
- 232. Toll Booth**—a shelter where a toll attendant is stationed to collect tolls or issue toll tickets. A toll booth is located adjacent to a toll lane and is typically set on a toll island.
- 233. Toll Island**—a raised island on which a toll booth or other toll collection and related equipment are located.
- 234. Toll Lane**—an individual lane located within a toll plaza in which a toll payment is collected or, for toll-ticket systems, a toll ticket is issued.
- 235. Toll Plaza**—the location at which tolls are collected consisting of a grouping of toll booths, toll islands, toll lanes, and, typically, a canopy. Toll plazas might be located on highway mainlines or on interchange ramps. A mainline toll plaza is sometimes referred to as a barrier toll plaza because it interrupts the traffic flow.

236. **Toll-Ticket System**—a system in which the user of a toll road receives a ticket from a machine or toll booth attendant upon entering a toll system. The ticket denotes the user's point of entry and, upon exiting the toll system, the user surrenders the ticket and is charged a toll based on the distance traveled between the points of entry and exit.
237. **Traffi** —pedestrians, bicyclists, ridden or herded animals, vehicles, streetcars, and other conveyances either singularly or together while using for purposes of travel any highway or private road open to public travel.
238. **Traffic Control Device**—a sign, signal, marking, or other device used to regulate, warn, or guide traffi , placed on, over, or adjacent to a street, highway, private road open to public travel, pedestrian facility, or shared-use path by authority of a public agency or offi ial having jurisdiction, or, in the case of a private road open to public travel, by authority of the private owner or private offi ial having jurisdiction.
239. **Traffic Control Signal (Traffic signal)**—any highway traffic signal by which traffic s alternately directed to stop and permitted to proceed.
240. **Train**—one or more locomotives coupled, with or without cars, that operates on rails or tracks and to which all other traffic ust yield the right-of-way by law at highway-rail grade crossings.
241. **Transverse Markings**—pavement markings that are generally placed perpendicular and across the flow of traffic uch as shoulder markings; word, symbol, and arrow markings; stop lines; crosswalk lines; speed measurement markings; parking space markings; and others.
242. **Traveled Way**—the portion of the roadway for the movement of vehicles, exclusive of the shoulders, berms, sidewalks, and parking lanes.
243. **Turn Bay**—a lane for the exclusive use of turning vehicles that is formed on the approach to the location where the turn is to be made. In most cases where turn bays are provided, drivers who desire to turn must move out of a through lane into the newly formed turn bay in order to turn. A through lane that becomes a turn lane is considered to be a dropped lane rather than a turn bay.
244. **Upstream**—a term that refers to a location that is encountered by traffic rior to a downstream location as it flows in an “upstream to downstream” direction. For example, “the upstream end of a lane line separating the turn lane from a through lane on the approach to an intersection” is the end of the line that is furthest from the intersection.
245. **Urban Street**—a type of street normally characterized by relatively low speeds, wide ranges of traffic olumes, narrower lanes, frequent intersections and driveways, signifi ant pedestrian traffi , and more businesses and houses.
246. **Vehicle**—every device in, upon, or by which any person or property can be transported or drawn upon a highway, except trains and light rail transit operating in exclusive or semi-exclusive alignments. Light rail transit equipment operating in a mixed-use alignment, to which other traffic is not required to yield the right-of-way by law, is a vehicle.
247. **Vibrotactile Pedestrian Device**—an accessible pedestrian signal feature that communicates, by touch, information about pedestrian timing using a vibrating surface.
248. **Visibility-Limited Signal Face or Visibility-Limited Signal Section**—a type of signal face or signal section designed (or shielded, hooded, or louvered) to restrict the visibility of a signal indication from the side, to a certain lane or lanes, or to a certain distance from the stop line.
249. **Walk Interval**—an interval during which the WALKING PERSON (symbolizing WALK) signal indication is displayed.
250. **Warning Beacon**—a beacon used only to supplement an appropriate warning or regulatory sign or marker.
251. **Warning Light**—a portable, powered, yellow, lens-directed, enclosed light that is used in a temporary traffic control zone in either a steady burn or a flashing mode.
252. **Warning Sign**—a sign that gives notice to road users of a situation that might not be readily apparent.
253. **Warrant**—a warrant describes a threshold condition based upon average or normal conditions that, if found to be satisfied as part of an engineering study, shall result in analysis of other traffic conditions or factors to determine whether a traffic control device or other improvement is justified. Warrants are not a substitute for engineering judgment. The fact that a warrant for a particular traffic control device is met is not conclusive justifi ation for the installation of the device.
254. **Wayside Equipment**—the signals, switches, and/or control devices for railroad or light rail transit operations housed within one or more enclosures located along the railroad or light rail transit right-of-way and/or on railroad or light rail transit property.
255. **Wayside Horn System**—a stationary horn (or series of horns) located at a grade crossing that is used in conjunction with train-activated or light rail transit-activated warning systems to provide audible warning of approaching rail traffic o road users on the highway or pathway approaches to a grade crossing, either as a supplement or alternative to the sounding of a locomotive horn.

- 256. **Worker**—a person on foot whose duties place him or her within the right-of-way of a street, highway, or pathway, such as street, highway, or pathway construction and maintenance forces, survey crews, utility crews, responders to incidents within the street, highway, or pathway right-of-way, and law enforcement personnel when directing traffic, investigating crashes, and handling lane closures, obstructed roadways, and disasters within the right-of-way of a street, highway, or pathway.
- 257. **Wrong-Way Arrow**—a slender, elongated, white pavement marking arrow placed upstream from the ramp terminus to indicate the correct direction of traffic flow. Wrong-way arrows are intended primarily to warn wrong-way road users that they are going in the wrong direction.
- 258. **Yellow Change Interval**—the first interval following the green or flashing arrow interval during which the steady yellow signal indication is displayed.
- 259. **Yield Line**—a row of solid white isosceles triangles pointing toward approaching vehicles extending across approach lanes to indicate the point at which the yield is intended or required to be made.

#### **Section 1A.14 Meanings of Acronyms and Abbreviations in this Manual**

##### **Standard:**

01 The following acronyms and abbreviations, when used in this Manual, shall have the following meanings:

- 1. **AADT**—annual average daily traffic
- 2. **AASHTO**—American Association of State Highway and Transportation Officials
- 3. **ADA**—Americans with Disabilities Act
- 4. **ADAAG**—Americans with Disabilities Accessibility Guidelines
- 5. **ADT**—average daily traffic
- 6. **AFAD**—Automated Flagger Assistance Device
- 7. **ANSI**—American National Standards Institute
- 8. **CFR**—Code of Federal Regulations
- 9. **CMS**—changeable message sign
- 10. **dba**—A-weighted decibels
- 11. **EPA**—Environmental Protection Agency
- 12. **ETC**—electronic toll collection
- 13. **EV**—electric vehicle
- 14. **FHWA**—Federal Highway Administration
- 15. **FRA**—Federal Railroad Administration
- 16. **FTA**—Federal Transit Administration
- 17. **HOT**—high occupancy tolls
- 18. **HOTM**—FHWA's Office of Transportation Management
- 19. **HOTO**—FHWA's Office of Transportation Operations
- 20. **HOV**—high-occupancy vehicle
- 21. **ILEV**—inherently low emission vehicle
- 22. **ISEA**—International Safety Equipment Association
- 23. **ITE**—Institute of Transportation Engineers
- 24. **ITS**—intelligent transportation systems
- 25. **LED**—light emitting diode
- 26. **LP**—liquid petroleum
- 27. **MPH or mph**—miles per hour
- 28. **MUTCD**—Manual on Uniform Traffic Control Devices
- 29. **NCHRP**—National Cooperative Highway Research Program
- 30. **ORT**—open-road tolling
- 31. **PCMS**—portable changeable message sign
- 32. **PRT**—perception-response time
- 33. **RPM**—raised pavement marker
- 34. **RRPM**—raised retroreflective pavement marker
- 35. **RV**—recreational vehicle
- 36. **TDD**—telecommunication devices for the deaf
- 37. **TRB**—Transportation Research Board
- 38. **TTC**—temporary traffic control
- 39. **U.S.**—United States
- 40. **U.S.C.**—United States Code
- 41. **USDOT**—United States Department of Transportation
- 42. **UVC**—Uniform Vehicle Code
- 43. **VPH or vph**—vehicles per hour

**Section 1A.15 Abbreviations Used on Traffic Control Devices****Standard:**

01 When the word messages shown in Table 1A-1 need to be abbreviated in connection with traffic control devices, the abbreviations shown in Table 1A-1 shall be used.

02 When the word messages shown in Table 1A-2 need to be abbreviated on a portable changeable message sign, the abbreviations shown in Table 1A-2 shall be used. Unless indicated by an asterisk, these abbreviations shall only be used on portable changeable message signs.

**Guidance:**

03 The abbreviations for the words listed in Table 1A-2 that also show a prompt word should not be used on a portable changeable message sign unless the prompt word shown in Table 1A-2 either precedes or follows the abbreviation, as applicable.

**Standard:**

04 The abbreviations shown in Table 1A-3 shall not be used in connection with traffic control devices because of their potential to be misinterpreted by road users.

**Guidance:**

05 If multiple abbreviations are permitted in Table 1A-1 or 1A-2, the same abbreviation should be used throughout a single jurisdiction.

06 Except as otherwise provided in Table 1A-1 or 1A-2 or unless necessary to avoid confusion, periods, commas, apostrophes, question marks, ampersands, and other punctuation marks or characters that are not letters or numerals should not be used in any abbreviation.

**Table 1A-1. Acceptable Abbreviations**

Word Message	Standard Abbreviation
Afternoon / Evening	PM
Alternate	ALT
AM Radio	AM
Avenue	AVE, AV
Bicycle	BIKE
Boulevard	BLVD*
Bridge	(See Table 1A-2)
CB Radio	CB
Center (as part of a place name)	CTR
Circle	CIR*
Civil Defense	CD
Compressed Natural Gas	CNG
Court	CT*
Crossing (other than highway-rail)	X-ING
Drive	DR*
East	E
Electric Vehicle	EV
Expressway	EXPWY*
Feet	FT
FM Radio	FM
Freeway	FRWY, FWY*
Friday	FRI
Hazardous Material	HAZMAT
High Occupancy Vehicle	HOV

Word Message	Standard Abbreviation
Highway	HWY*
Hospital	HOSP
Hour(s)	HR, HRS
Information	INFO
Inherently Low Emission Vehicle	ILEV
International	INTL
Interstate	(See Table 1A-2)
Junction / Intersection	JCT
Lane	(See Table 1A-2)
Liquid Propane Gas	LP-GAS
Maximum	MAX
Mile(s)	MI
Miles Per Hour	MPH
Minimum	MIN
Minute(s)	MIN
Monday	MON
Morning / Late Night	AM
Mount	MT
Mountain	MTN
National	NATL
North	N
Parkway	PKWY*
Pedestrian	PED
Place	PL*

Word Message	Standard Abbreviation
Pounds	LBS
Road	RD*
Saint	ST
Saturday	SAT
South	S
State, county, or other non-US or non-Interstate numbered route	(See Table 1A-2)
Street	ST*
Sunday	SUN
Telephone	PHONE
Temporary	TEMP
Terrace	TER*
Thursday	THURS
Thruway	THWY*
Tons of Weight	T
Trail	TR*
Tuesday	TUES
Turnpike	TPK*
Two-Way Intersection	2-WAY
US Numbered Route	US
Wednesday	WED
West	W

\*This abbreviation shall not be used for any application other than the name of a roadway.

**Table 1A-2. Abbreviations That Shall be Used Only  
on Portable Changeable Message Signs**

Word Message	Standard Abbreviation	Prompt Word That Should Precede the Abbreviation	Prompt Word That Should Follow the Abbreviation
Access	ACCS	—	Road
Ahead	AHD	Fog	—
Blocked	BLKD	Lane	—
Bridge	BR*	[Name]	—
Cannot	CANT	—	—
Center	CNTR	—	Lane
Chemical	CHEM	—	Spill
Condition	COND	Traffic	—
Congested	CONG	Traffic	—
Construction	CONST	—	Ahead
Crossing	XING	—	—
Do Not	DONT	—	—
Downtown	DWNTN	—	Traffic
Eastbound	E-BND	—	—
Emergency	EMER	—	—
Entrance, Enter	ENT	—	—
Exit	EX	Next	—
Express	EXP	—	Lane
Frontage	FRNTG	—	Road
Hazardous	HAZ	—	Driving
Highway-Rail Grade Crossing	RR XING	—	—
Interstate	I-*	—	[Number]
It Is	ITS	—	—
Lane	LN	[Roadway Name]*, Right, Left, Center	—
Left	LFT	—	—
Local	LOC	—	Traffic
Lower	LWR	—	Level
Maintenance	MAINT	—	—
Major	MAJ	—	Accident
Minor	MNR	—	Accident
Normal	NORM	—	—
Northbound	N-BND	—	—
Oversized	OVRSZ	—	Load
Parking	PKING	—	—
Pavement	PVMT	Wet	—
Prepare	PREP	—	To Stop
Quality	QLTY	Air	—
Right	RT	Keep, Next	—
Right	RT	—	Lane
Roadwork	RDWK	—	Ahead, [Distance]
Route	RT, RTE	Best	—
Service	SERV	—	—
Shoulder	SHLDR	—	—
Slippery	SLIP	—	—
Southbound	S-BND	—	—
Speed	SPD	—	—
State, county, or other non-US or non-Interstate numbered route	[Route Abbreviation determined by highway agency]**	—	[Number]
Tires With Lugs	LUGS	—	—
Traffic	TRAF	—	—
Travelers	TRVLRS	—	—
Two-Wheeled Vehicles	CYCLES	—	—
Upper	UPR	—	Level
Vehicle(s)	VEH, VEHS	—	—
Warning	WARN	—	—
Westbound	W-BND	—	—
Will Not	WONT	—	—

\* This abbreviation, when accompanied by the prompt word, may be used on traffic control devices other than portable changeable message signs.

\*\* A space and no dash shall be placed between the abbreviation and the number of the route.



**Table 1A-3. Unacceptable Abbreviations**

Abbreviation	Intended Word	Common Misinterpretation
ACC	Accident	Access (Road)
CLRS	Clears	Colors
DLY	Delay	Daily
FDR	Feeder	Federal
L	Left	Lane (Merge)
LT	Light (Traffic)	Left
PARK	Parking	Park
POLL	Pollution (Index)	Poll
RED	Reduce	Red
STAD	Stadium	Standard
WRNG	Warning	Wrong