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).

The California Manual on Uniform Traffic Control Devices (California MUTCD) is published by the State of California, Department of Transportation (Caltrans) and is issued to adopt uniform standards and specifications for all official traffic control devices, in accordance with Section 21400 of the California Vehicle Code.

This manual is current as of the date of publication on the footer page. However, it may be necessary from time to time to modify, change or adopt new standards and specifications for traffic control devices and/or issue errata or editorial changes to the manual. To ensure that the traffic control device practitioner is accessing the most current information regarding traffic control device topics for California, the practitioner is advised to always reference the California MUTCD web site.

The California MUTCD, California Sign Specifications and other publications and related current information is available on the Internet at the following web link:

http://www.dot.ca.gov/traffops/engineering/

Addresses for Publications Referenced in the California MUTCD

American Automobile Association (AAA)
1000 AAA Drive
Heathrow, FL 32746
calstate.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
202-624-5800

American National Standards Institute (ANSI)
1819 L Street, NW, 6th floor
Washington, DC 20036
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
301-459-3200

California Building Standards Code
International Conference of Building Officials
5360 South Workman Mill Road
Whittier, CA 90601
www.icbo.org
916-263-0916
National Committee on Uniform Traffic Laws and Ordinances (NCUTLO)
107 South West Street, Suite 110
Alexandria, VA 22314
www.ncutlo.org

National Electrical Manufacturers Association (NEMA)
1300 North 17th Street, Suite 1752
Rosslyn, VA 22209
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
800–321–6742

Transportation Research Board (TRB)
The National Academies
500 Fifth Street, NW
Washington, DC 20001
www.nas.edu/trb
202-334-2934

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
202–272–0080

Revised March 9, 2018
Acknowledgments

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

Caltrans gratefully acknowledges the participation from the following contributors for providing invaluable time, support, guidance and direction in the development of this Manual:

- Federal Highway Administration's California Division
- California Traffic Control Devices Committee (CTCDC) members;
- Staff from various cities and counties in California who participated in CTCDC meetings
- Caltrans headquarters’ and districts’ staff

Information regarding the California portion (blue text and/or blue border line) of this Manual can be obtained by writing to:

State of California
Department of Transportation,
Chief, Division of Traffic Operations, MS-36
1120 N Street, Sacramento, CA 95814

NOTE: The contents of this publication are not copyrighted. They may be reprinted freely.

The California MUTCD is available on the Caltrans Web Page at:
http://www.dot.ca.gov/camutcd
March 17, 2020

Mr. Hamid Bahadori, Chair
California Traffic Control Devices Committee
P.O. Box 942874, MS-36
Sacramento, CA 94274-0001

Dear Mr. Bahadori:

Effective March 27, 2020, the California Department of Transportation (Caltrans) will be updating the California Manual on Uniform Traffic Control Devices (CA MUTCD) 2014 Revision 5 to provide uniform standards and specifications for all official traffic control devices in California. This action was taken pursuant to the provisions of California Vehicle Code Section 21400 and the recommendations of the California Traffic Control Devices Committee (CTCDC).

Caltrans has received a letter from the Federal Highway Administration (FHWA) confirming substantial conformance of the CA MUTCD 2014, Revision 5 Edition. The revised CA MUTCD includes the FHWA’s Manual on Uniform Traffic Control Devices, policies on traffic control devices issued by Caltrans since March 29, 2019, and other corrections and format changes. The CA MUTCD revision is available on the Internet at <www.dot.ca.gov/trafficops/camutcd/>.

The Division of Traffic Operations is grateful to the CTCDC members for providing invaluable time, support, guidance and direction in the development of this version of the CA MUTCD.

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"
If you have any questions or concerns, please contact Mr. Vijay Talada, CA MUTCD Editor and CTCDC Executive Secretary, Division of Traffic Operations at (916)653-1816, or by email at <vijay.talada@dot.ca.gov>.

Sincerely,

[Signature]

JASVINDERJIT S. BHULLAR, P.E., T.E., Chief
Division of Traffic Operations

c: Vijay Talada, CA MUTCD Editor, Division of Traffic Operations, California
Department of Transportation

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"
California Division
650 Capitol Mall, Suite 4-100
Sacramento, CA 95814

March 16, 2020

(916) 498-5001
(916) 498-5008 (FAX)

In Reply Refer To:
HDA-CA

Mr. Toks Omishakin
Director, California Department of Transportation
1120 N Street
Sacramento, CA 95814

Attention: Jasvinderjit Bhullar, Chief, Division of Traffic Operations

SUBJECT: 2014 CA MUTCD Revision 5 Substantial Conformance with 2009 National MUTCD.

Dear Mr. Omishakin:

This letter is in response to the February 20, 2020, letter from Mr. Jasvinderjit Bhullar requesting the Federal Highway Administration (FHWA) to find Revision 5 to the 2014 California Manual on Uniform Traffic Control Devices (CA MUTCD) to be in substantial conformance with the current 2009 Edition of the National Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, Revisions 1 and 2.

Per Title 23, Code of Federal Regulations [23 CFR 655.603(b)(1)], FHWA has reviewed the 2014 CA MUTCD Revision 5 and found the proposed revisions to be in substantial conformance with the 2009 National MUTCD.

We look forward to continue working with Caltrans, local public agencies, and the California Traffic Control Devices Committee on needed revisions to the CA MUTCD. This effort results in traffic control devices that enhance the safety of California's roadways for all road users. We commend the effort that Caltrans' Office of Traffic Engineering devotes to achieve this objective.

If you have any questions, please contact Steve Pyburn, Senior Traffic Safety and ITS Engineer, at (916) 498-5057 or Steve.Pyburn@dot.gov.

Sincerely,

[Signature]

For: Vincent Marmano
Division Administrator

Enclosures: Signed CT Letter to FHWA
List of Changes for 2014 CA MUTCD Revision 5
February 20, 2020

Mr. Vincent Mammano
Division Administrator
Federal Highway Administration
650 Capitol Mall, Suite 4-100
Sacramento, CA 95814

Dear Mr. Mammano:

The California Department of Transportation (Caltrans) requests a letter from the Federal Highway Administration (FHWA) confirming substantial conformance with FHWA’s 2009 Manual on Uniform Traffic Control Devices (MUTCD) for the revised 2014 California Manual on Uniform Traffic Control Devices (CA MUTCD), as required by Title 23 Code of Federal Regulations, Section 655.603(b)(1).

The revised CA MUTCD includes FHWA’s MUTCD, policies on traffic control devices issued by Caltrans since March 29, 2019, and other corrections and format changes. The approved revision will be available on the Internet at <http://www.dot.ca.gov/programs/traffic-operations/camutcd> after substantial conformance has been granted by FHWA.

Caltrans would like to acknowledge the efforts of Mr. Steve Pyburn for working in partnership with Mr. Vijay Talada of Caltrans’ Division of Traffic Operations in reviewing the draft revision of the CA MUTCD. An electronic version of the CA MUTCD has been provided to Mr. Pyburn.

Please send the requested letter by March 1, 2020, to Mr. Talada, CA MUTCD Editor, via e-mail to <vijay.talada@dot.ca.gov>. If you have any questions, please contact Mr. Talada at (916) 653-1816, or at the above e-mail address.

Sincerely,

[Signature]

JASVINDERJIT S. BHULLAR, P.E., T.E., Chief
Division of Traffic Operations

C: Vijay Talada, CA MUTCD Editor, Office of Traffic Engineering, Division of Traffic Operations, California Department of Transportation

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California’s economy and livability"
# CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>REFERENCES</td>
<td></td>
<td>i</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td></td>
<td>v</td>
</tr>
<tr>
<td>CTCDC NOTIFICATION LETTER</td>
<td></td>
<td>vii</td>
</tr>
<tr>
<td>FHWA LETTER OF SUBSTANTIAL CONFORMANCE</td>
<td></td>
<td>ix</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td></td>
<td>25</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td></td>
<td>38</td>
</tr>
<tr>
<td>FOREWORD</td>
<td></td>
<td>41</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td></td>
<td>43</td>
</tr>
<tr>
<td>PART 1. GENERAL</td>
<td></td>
<td>53</td>
</tr>
</tbody>
</table>

### CHAPTER 1A. GENERAL

- Section 1A.01 Purpose of Traffic Control Devices 53
- Section 1A.02 Principles of Traffic Control Devices 53
- Section 1A.03 Design of Traffic Control Devices 54
- Section 1A.04 Placement and Operation of Traffic Control Devices 54
- Section 1A.05 Maintenance of Traffic Control Devices 54
- Section 1A.06 Uniformity of Traffic Control Devices 54
- Section 1A.07 Responsibility for Traffic Control Devices 55
- Section 1A.08 Authority for Placement of Traffic Control Devices 56
- Section 1A.09 Engineering Study and Engineering Judgment 58
- Section 1A.10 Interpretations, Experimentations, Changes, and Interim Approvals 58
- Section 1A.11 Relation to Other Publications 65
- Section 1A.12 Color Code 67
- Section 1A.13 Definitions of Headings, Words, and Phrases in this Manual 67
- Section 1A.14 Meanings of Acronyms and Abbreviations in this Manual 85
- Section 1A.15 Abbreviations Used on Traffic Control Devices 91

### PART 2. SIGNS

### CHAPTER 2A. GENERAL

- Section 2A.01 Function and Purpose of Signs 99
- Section 2A.02 Definitions 99
- Section 2A.03 Standardization of Application 99
| Section 2A.04 | Excessive Use of Signs | 100 |
| Section 2A.05 | Classification of Signs | 100 |
| Section 2A.06 | Design of Signs | 100 |
| Section 2A.07 | Retroreflectivity and Illumination | 102 |
| Section 2A.08 | Maintaining Minimum Retroreflectivity | 103 |
| Section 2A.09 | Shapes | 104 |
| Section 2A.10 | Sign Colors | 104 |
| Section 2A.11 | Dimensions | 104 |
| Section 2A.12 | Symbols | 105 |
| Section 2A.13 | Word Messages | 106 |
| Section 2A.14 | Sign Borders | 107 |
| Section 2A.15 | Enhanced Conspicuity for Standard Signs | 107 |
| Section 2A.16 | Standardization of Location | 108 |
| Section 2A.17 | Overhead Sign Installations | 109 |
| Section 2A.18 | Mounting Height | 110 |
| Section 2A.19 | Lateral Offset | 112 |
| Section 2A.20 | Orientation | 113 |
| Section 2A.21 | Posts and Mountings | 113 |
| Section 2A.22 | Maintenance | 114 |
| Section 2A.23 | Median Opening Treatments for Divided Highways with Wide Medians | 114 |
| Section 2A.101(CA) | Signs Off the State Right-of-Way | 114 |

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

| Section 2B.01 | Application of Regulatory Signs | 125 |
| Section 2B.02 | Design of Regulatory Signs | 125 |
| Section 2B.03 | Size of Regulatory Signs | 125 |
| Section 2B.04 | Right-of-Way at Intersections | 126 |
| Section 2B.05 | STOP Sign (R1-1) and ALL WAY Plaque (R1-3P) | 128 |
| Section 2B.06 | STOP Sign Applications | 129 |
| Section 2B.07 | Multi-Way Stop Applications | 129 |
| Section 2B.08 | YIELD Sign (R1-2) | 130 |
| Section 2B.09 | YIELD Sign Applications | 130 |
| Section 2B.10 | STOP Sign or YIELD Sign Placement | 130 |
| Section 2B.11 | Yield Here To Pedestrians Signs and Stop Here For Pedestrians Signs (R1-5 Series) | 132 |
| Section 2B.12 | In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9, and R1-9a) | 132 |
| Section 2B.13 | Speed Limit Sign (R2-1) | 133 |
| Section 2B.14 | Truck Speed Limit Plaque (R2-2P) | 143 |
| Section 2B.15 | Night Speed Limit Plaque (R2-3P) | 143 |
| Section 2B.16 | Minimum Speed Limit Plaque (R2-4P) | 143 |
| Section 2B.17 | Higher Fines Signs and Plaque (R2-6P, R2-10, and R2-11) | 144 |
| Section 2B.18 | Movement Prohibition Signs (R3-1 through R3-4, R3-18, and R3-27) | 145 |
| Section 2B.19 | Intersection Lane Control Signs (R3-5 through R3-8) | 147 |
| Section 2B.20 | Mandatory Movement Lane Control Signs (R3-5, R3-5a, R3-7, and R3-20) | 148 |
| Section 2B.21 | Optional Movement Lane Control Sign (R3-6) | 150 |
| Section 2B.22 | Advance Intersection Lane Control Signs (R3-8 Series) | 150 |
| Section 2B.23 | RIGHT (LEFT) LANE MUST EXIT Sign (R3-33) | 151 |
| Section 2B.24 | Two-Way Left Turn Only Signs (R3-9a, R3-9b) | 151 |
| Section 2B.25 | BEGIN and END Plaques (R3-9cP, R3-9dP) | 151 |
| Section 2B.26 | Reversible Lane Control Signs (R3-9e through R3-9i) | 152 |
| Section 2B.27 | Jughandle Signs (R3-23, R3-24, R3-25, and R3-26 Series) | 153 |
| Section 2B.28 | DO NOT PASS Sign (R4-1) | 154 |
| Section 2B.29 | PASS WITH CARE Sign (R4-2) | 154 |
Table of Contents

Section 2B.30  KEEP RIGHT EXCEPT TO PASS Sign (R4-16) and SLOWER TRAFFIC KEEP
RIGHT Sign (R4-3)  154
Section 2B.31  TRUCKS USE RIGHT LANE Sign (R4-5)  155
Section 2B.32  Keep Right and Keep Left Signs (R4-7, R4-8)  156
Section 2B.33  STAY IN LANE Sign (R4-9)  156
Section 2B.34  RUNAWAY VEHICLES ONLY Sign (R4-10)  156
Section 2B.35  Slow Vehicle Turn-Out Signs (R4-12, R4-13, and R4-14)  156
Section 2B.36  DO NOT DRIVE ON SHOULDER Sign (R4-17) and DO NOT PASS ON
SHOULDER Sign (R4-18)  157
Section 2B.37  DO NOT ENTER Sign (R5-1)  157
Section 2B.38  WRONG WAY Sign (R5-1a)  158
Section 2B.39  Selective Exclusion Signs  158
Section 2B.40  ONE WAY Signs (R6-1, R6-2)  161
Section 2B.41  Wrong-Way Traffic Control at Interchange Ramps  162
Section 2B.42  Divided Highway Crossing Signs (R6-3, R6-3a)  165
Section 2B.43  Roundabout Directional Arrow Signs (R6-4, R6-4a, and R6-4b)  166
Section 2B.44  Roundabout Circulation Plaque (R6-5P)  166
Section 2B.45  Examples of Roundabout Signing  166
Section 2B.46  Parking, Standing, and Stopping Signs (R7 and R8 Series)  167
Section 2B.47  Design of Parking, Standing, and Stopping Signs  173
Section 2B.48  Placement of Parking, Stopping, and Standing Signs  175
Section 2B.49  Emergency Restriction Signs (R8-4, R8-7, R8-8)  175
Section 2B.50  WALK ON LEFT FACING TRAFFIC and No Hitchhiking Signs (R9-1, R9-4, R9-4a)  176
Section 2B.51  Pedestrian Crossing Signs (R9-2, R9-3)  176
Section 2B.52  Traffic Signal Pedestrian and Bicycle Actuation Signs (R10-1 through R10-4, and R10-24 through R10-26)  176
Section 2B.53  Traffic Signal Signs (R10-5 through R10-30)  177
Section 2B.54  No Turn on Red Signs (R10-11 Series, R10-17a, and R10-30)  178
Section 2B.55  Photo Enforced Signs and Plaques (R10-18, R10-19P, R10-19aP)  180
Section 2B.56  Ramp Metering Signs (R10-28 and R10-29)  180
Section 2B.57  KEEP OFF MEDIAN Sign (R11-1)  181
Section 2B.58  ROAD CLOSED Sign (R11-2) and LOCAL TRAFFIC ONLY Signs (R11-3 Series, R11-4)  181
Section 2B.59  Weight Limit Signs (R12-1 through R12-5)  181
Section 2B.60  Weigh Station Signs (R13 Series)  182
Section 2B.61  TRUCK ROUTE Sign (R14-1)  183
Section 2B.62  Hazardous Material Signs (R14-2, R14-3)  184
Section 2B.63  National Network Signs (R14-4, R14-5)  185
Section 2B.64  Headlight Use Signs (R16-5 through R16-11)  185
Section 2B.65  FENDER BENDER Sign (R16-4)  186
Section 2B.66  Seat Belt Symbol  187
Section 2B.67  Barricades  187
Section 2B.68  Gates  187
Section 2B.101(CA)  NO FISHING (JUMPING) FROM BRIDGE Sign (R23(CA))  188
Section 2B.102(CA)  TWO WAY TRAFFIC AHEAD Sign (R40(CA))  189
Section 2B.103(CA)  $1000 Fine Signs (R47(CA) and R47A(CA))  189
Section 2B.104(CA)  PRIVATE ROAD (PRIVATE PROPERTY) VEHICLE CODE ENFORCED Sign (R101(CA))  189
Section 2B.105(CA)  Rest Area Disclaimer Sign (SR2(CA))  189
Section 2B.106(CA)  Garbage Prohibition Signs (SR22-1(CA) and SR23-1(CA))  189
Section 2B.107(CA)  GOLF CARTS OK DAYLIGHT HOURS Sign (SR43(CA))  189
Section 2B.108(CA)  Bus and Truck Registration Sign (SR44(CA))  190
Section 2B.109(CA)  EMERGENCY ACCESS KEEP CLEAR Sign (SR46(CA))  190
Section 2B.110(CA)  Off Highway Vehicle Signs (SR47(CA) and SR48(CA))  190
## CHAPTER 2C. WARNING SIGNS AND OBJECT MARKERS

| Section 2C.01 | Function of Warning Signs | 257 |
| Section 2C.02 | Application of Warning Signs | 257 |
| Section 2C.03 | Design of Warning Signs | 257 |
| Section 2C.04 | Size of Warning Signs | 258 |
| Section 2C.05 | Placement of Warning Signs | 258 |
| Section 2C.06 | Horizontal Alignment Warning Signs | 259 |
| Section 2C.07 | Horizontal Alignment Signs (W1-1 through W1-5, W1-11, W1-15) | 259 |
| Section 2C.08 | Advisory Speed Plaque (W13-1P) | 260 |
| Section 2C.09 | Chevron Alignment Sign (W1-8) | 261 |
| Section 2C.10 | Combination Horizontal Alignment/Advisory Speed Signs (W1-1a, W1-2a) | 262 |
| Section 2C.11 | Combination Horizontal Alignment/Intersection Signs (W1-10 Series) | 263 |
| Section 2C.12 | One-Direction Large Arrow Sign (W1-6) | 263 |
| Section 2C.13 | Truck Rollover Warning Sign (W1-13) | 264 |
| Section 2C.14 | Advisory Exit and Ramp Speed Signs (W13-2 and W13-3) | 264 |
| Section 2C.15 | Combination Horizontal Alignment/Advisory Exit and Ramp Speed Signs (W13-6 and W13-7) | 265 |
| Section 2C.16 | Hill Signs (W7-1, W7-1a) | 265 |
| Section 2C.17 | Truck Escape Ramp Signs (W7-4 Series) | 266 |
| Section 2C.18 | HILL BLOCKS VIEW Sign (W7-6) | 266 |
| Section 2C.19 | ROAD NARROWS Sign (W5-1) | 266 |
| Section 2C.20 | NARROW BRIDGE Sign (W5-2) | 267 |
| Section 2C.21 | ONE LANE BRIDGE Sign (W5-3) | 267 |
| Section 2C.22 | Divided Highway Sign (W6-1) | 267 |
| Section 2C.23 | Divided Highway Ends Sign (W6-2) | 267 |
| Section 2C.24 | Freeway or Expressway Ends Signs (W19 Series) | 267 |
| Section 2C.25 | Double Arrow Sign (W12-1) | 268 |
| Section 2C.26 | DEAD END/NO OUTLET Signs (W14-1, W14-1a, W14-2, W14-2a) | 268 |
| Section 2C.27 | Low Clearance Signs (W12-2 and W12-2a) | 268 |
| Section 2C.28 | BUMP and DIP Signs (W8-1, W8-2) | 269 |
| Section 2C.29 | SPEED HUMP Sign (W17-1) | 270 |
| Section 2C.30 | PAVEMENT ENDS Sign (W8-3) | 270 |
| Section 2C.31 | Shoulder Signs (W8-4, W8-9, W8-17, W8-23, and W8-25) | 270 |
| Section 2C.32 | Surface Condition Signs (W8-5, W8-7, W8-8, W8-11, W8-13, and W8-14) | 271 |
| Section 2C.33 | Warning Signs and Plaques for Motorcyclists (W8-15, W8-15P, and W8-16) | 272 |
| Section 2C.34 | NO CENTER LINE Sign (W8-12) | 272 |
| Section 2C.35 | Weather Condition Signs (W8-18, W8-19, W8-21, and W8-22) | 272 |
| Section 2C.36 | Advance Traffic Control Signs (W3-1, W3-2, W3-3, W3-4) | 273 |
| Section 2C.37 | Advance Ramp Control Signal Signs (W3-7 and W3-8) | 274 |
| Section 2C.38 | Reduced Speed Limit Ahead Signs (W3-5, W3-5a) | 274 |
| Section 2C.39 | DRAW BRIDGE Sign (W3-6) | 275 |
| Section 2C.40 | Merge Signs (W4-1, W4-5) | 275 |
| Section 2C.41 | Added Lane Signs (W4-3, W4-6) | 276 |
| Section 2C.42 | Lane Ends Signs (W4-2, W9-1, W9-2) | 276 |
| Section 2C.43 | RIGHT (LEFT) LANE EXIT ONLY AHEAD Sign (W9-7) | 277 |
| Section 2C.44 | Two-Way Traffic Sign (W6-3) | 278 |
| Section 2C.45 | NO PASSING ZONE Sign (W14-3) | 278 |
| Section 2C.46 | Intersection Warning Signs (W2-1 through W2-8) | 278 |
Table of Contents

Section 2C.47 Two-Direction Large Arrow Sign (W1-7) 279
Section 2C.48 Traffic Signal Signs (W25-1, W25-2) 280
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) 281
Section 2C.51 Playground Sign (W15-1) 283
Section 2C.52 NEW TRAFFIC PATTERN AHEAD Sign (W23-2) 283
Section 2C.53 Use of Supplemental Warning Plaques 283
Section 2C.54 Design of Supplemental Warning Plaques 284
Section 2C.55 Distance Plaques (W16-2 Series, W16-3 Series, W16-4P, W7-3aP) 284
Section 2C.56 Supplemental Arrow Plaques (W16-5P, W16-6P) 284
Section 2C.57 Hill-Related Plaques (W7-2 Series, W7-3 Series) 284
Section 2C.58 Advance Street Name Plaque (W16-8P, W16-8aP) 284
Section 2C.59 CROSS TRAFFIC DOES NOT STOP Plaque (W4-4P) 285
Section 2C.60 SHARE THE ROAD Plaque (W16-1P) 285
Section 2C.61 Photo Enforced Plaque (W16-10P) 285
Section 2C.62 NEW Plaque (W16-15P) 286
Section 2C.63 Object Marker Design and Placement Height 286
Section 2C.64 Object Markers for Obstructions Within the Roadway 287
Section 2C.65 Object Markers for Obstructions Adjacent to the Roadway 287
Section 2C.66 Object Markers for Ends of Roadways 288

CHAPTER 2D. GUIDE SIGNS—CONVENTIONAL ROADS 315

Section 2D.01 Scope of Conventional Road Guide Sign Standards 315
Section 2D.02 Application 315
Section 2D.03 Color, Retroreflection, and Illumination 315
Section 2D.04 Size of Signs 317
Section 2D.05 Lettering Style 317
Section 2D.06 Size of Lettering 317
Section 2D.07 Amount of Legend 318
Section 2D.08 Arrows 318
Section 2D.09 Numbered Highway Systems 320
Section 2D.10 Route Signs and Auxiliary Signs 321
Section 2D.11 Design of Route Signs 322
Section 2D.12 Design of Route Sign Auxiliaries 323
Section 2D.13 Junction Auxiliary Sign (M2-1) 324
Section 2D.14 Combination Junction Sign (M2-2) 324
Section 2D.15 Cardinal Direction Auxiliary Signs (M3-1 through M3-4) 324
Section 2D.16 Auxiliary Signs for Alternative Routes (M4 Series) 325
Section 2D.17 ALTERNATE Auxiliary Signs (M4-1, M4-1a) 325
Section 2D.18 BY-PASS Auxiliary Sign (M4-2) 325
Section 2D.19 BUSINESS Auxiliary Sign (M4-3) 325
Section 2D.20 TRUCK Auxiliary Sign (M4-4) 325
Section 2D.21 TO Auxiliary Sign (M4-5) 326
Section 2D.22 END Auxiliary Sign (M4-6) 326
Section 2D.23 BEGIN Auxiliary Sign (M4-14) 326
Section 2D.24 TEMPORARY Auxiliary Signs (M4-7, M4-7a) 326
Section 2D.25 Temporary Detour and Auxiliary Signs 326
Section 2D.26 Advance Turn Arrow Auxiliary Signs (M5-1, M5-2, and M5-3) 327
Section 2D.27 Lane Designation Auxiliary Signs (M5-4, M5-5, and M5-6) 327
Section 2D.28 Directional Arrow Auxiliary Signs (M6 Series) 327
Section 2D.29  Route Sign Assemblies 328
Section 2D.30  Junction Assembly 328
Section 2D.31  Advance Route Turn Assembly 329
Section 2D.32  Directional Assembly 330
Section 2D.33  Combination Lane-Use/Destination Overhead Guide Sign (D15-1) 331
Section 2D.34  Confirming or Reassurance Assemblies 331
Section 2D.35  Trailblazer Assembly 331
Section 2D.36  Destination and Distance Signs 332
Section 2D.37  Destination Signs (D1 Series) 332
Section 2D.38  Destination Signs at Circular Intersections 335
Section 2D.39  Destination Signs at Jughandles 336
Section 2D.40  Location of Destination Signs 336
Section 2D.41  Distance Signs (D2 Series) 336
Section 2D.42  Location of Distance Signs 337
Section 2D.43  Street Name Signs (D3-1 or D3-1a) 337
Section 2D.44  Advance Street Name Signs (D3-2) 339
Section 2D.45  Signing on Conventional Roads on Approaches to Interchanges 340
Section 2D.46  Freeway Entrance Signs (D13-3 and D13-3a) 341
Section 2D.47  Parking Area Guide Sign (D4-1) 342
Section 2D.48  PARK - RIDE Sign (D4-2) 342
Section 2D.49  Weigh Station Signing (D8 Series) 343
Section 2D.50  Community Wayfinding Signs 343
Section 2D.51  Truck, Passing, or Climbing Lane Signs (D17-1 and D17-2) 347
Section 2D.52  Slow Vehicle Turn-Out Sign (D17-7) 347
Section 2D.53  Signing of Named Highways 347
Section 2D.54  Crossover Signs (D13-1 and D13-2) 348
Section 2D.55  National Scenic Byways Signs (D6-4, D6-4a) 348
Section 2E.01  Scope of Freeway and Expressway Guide Sign Standards 387
Section 2E.02  Freeway and Expressway Signing Principles 387
Section 2E.03  Guide Sign Classification 387
Section 2E.04  General 388
Section 2E.05  Color of Guide Signs 388
Section 2E.06  Retroreflection or Illumination 388
Section 2E.07  Characteristics of Urban Signing 388
Section 2E.08  Characteristics of Rural Signing 389
Section 2E.09  Signing of Named Highways 389
Section 2E.10  Amount of Legend on Guide Signs 389
Section 2E.11  Number of Signs at an Overhead Installation and Sign Spreading 389
Section 2E.12  Pull-Through Signs (E6-2, E6-2a) 390
Section 2E.13  Designation of Destinations 390
Section 2E.14  Size and Style of Letters and Signs 391
Section 2E.15  Interline and Edge Spacing 392
Section 2E.16  Sign Borders 392
Section 2E.17  Abbreviations 392
Section 2E.18  Symbols 393
Section 2E.19  Arrows for Interchange Guide Signs 393
Section 2E.20  Signing for Option Lanes at Splits and Multi-Lane Exits 393
| Section 2E.21 | Design of Overhead Arrow-per-Lane Guide Signs for Option Lanes | 394 |
| Section 2E.22 | Design of Freeway and Expressway Diagrammatic Guide Signs for Option Lanes | 396 |
| Section 2E.23 | Signing for Intermediate and Minor Interchange Multi-Lane Exits with an Option Lane | 397 |
| Section 2E.24 | Signing for Interchange Lane Drops | 397 |
| Section 2E.25 | Overhead Sign Installations | 398 |
| Section 2E.26 | Lateral Offset | 399 |
| Section 2E.27 | Route Signs and Trailblazer Assemblies | 399 |
| Section 2E.28 | Eisenhower Interstate System Signs (M1-10, M1-10a) | 400 |
| Section 2E.29 | Signs for Intersections at Grade | 400 |
| Section 2E.30 | Interchange Guide Signs | 400 |
| Section 2E.31 | Interchange Exit Numbering | 401 |
| Section 2E.32 | Interchange Classification | 404 |
| Section 2E.33 | Advance Guide Signs | 404 |
| Section 2E.34 | Next Exit Plaques | 405 |
| Section 2E.35 | Other Supplemental Guide Signs | 406 |
| Section 2E.36 | Exit Direction Signs | 407 |
| Section 2E.37 | Exit Gore Signs (E5-1 Series) | 408 |
| Section 2E.38 | Post-Interchange Signs | 409 |
| Section 2E.39 | Post-Interchange Distance Signs | 409 |
| Section 2E.40 | Interchange Sequence Signs | 409 |
| Section 2E.41 | Community Interchanges Identification Signs | 410 |
| Section 2E.42 | NEXT XX EXITS Sign | 411 |
| Section 2E.43 | Signing by Type of Interchange | 411 |
| Section 2E.44 | Freeway-to-Freeway Interchange | 411 |
| Section 2E.45 | Cloverleaf Interchange | 412 |
| Section 2E.46 | Cloverleaf Interchange with Collector-Distributor Roadways | 412 |
| Section 2E.47 | Partial Cloverleaf Interchange | 412 |
| Section 2E.48 | Diamond Interchange | 413 |
| Section 2E.49 | Diamond Interchange in Urban Area | 413 |
| Section 2E.50 | Closely-Spaced Interchanges | 413 |
| Section 2E.51 | Minor Interchange | 414 |
| Section 2E.52 | Signing on Conventional Road Approaches and Connecting Roadways | 414 |
| Section 2E.53 | Wrong-Way Traffic Control at Interchange Ramps | 414 |
| Section 2E.54 | Weigh Station Signing | 414 |

### CHAPTER 2F. TOLL ROAD SIGNS

| Section 2F.01 | Scope | 465 |
| Section 2F.02 | Sizes of Toll Road Signs | 465 |
| Section 2F.03 | Use of Purple Backgrounds and Underlay Panels with ETC Account Pictographs | 465 |
| Section 2F.04 | Size of ETC Pictographs | 466 |
| Section 2F.05 | Regulatory Signs for Toll Plazas | 466 |
| Section 2F.06 | Pay Toll Advance Warning Sign (W9-6) | 467 |
| Section 2F.07 | Pay Toll Advance Warning Plaque (W9-6P) | 468 |
| Section 2F.08 | Stop Ahead Pay Toll Warning Sign (W9-6a) | 468 |
| Section 2F.09 | Stop Ahead Pay Toll Warning Plaque (W9-6aP) | 469 |
| Section 2F.10 | LAST EXIT BEFORE TOLL Warning Plaque (W16-16P) | 469 |
| Section 2F.11 | TOLL Auxiliary Sign (M4-15) | 469 |
| Section 2F.12 | Electronic Toll Collection (ETC) Account-Only Auxiliary Signs (M4-16 and M4-20) | 469 |
| Section 2F.13 | Toll Facility and Toll Plaza Guide Signs – General | 469 |
| Section 2F.14 | Advance Signs for Conventional Toll Plazas | 471 |
Section 2F.15  Advance Signs for Toll Plazas on Diverging Alignments from Open-Road ETC Account-Only Lanes
   472
Section 2F.16  Toll Plaza Canopy Signs
   472
Section 2F.17  Guide Signs for Entrances to ETC Account-Only Facilities
   473
Section 2F.18  ETC Program Information Signs
   473

CHAPTER 2G.  PREFERENTIAL AND MANAGED LANE SIGNS
   483
Section 2G.01  Scope
   483
Section 2G.02  Sizes of Preferential and Managed Lane Signs
   483
Section 2G.03  Regulatory Signs for Preferential Lanes – General
   483
Section 2G.04  Preferential Lane Vehicle Occupancy Definition Regulatory Signs (R3-10 Series and R3-13 Series)
   486
Section 2G.05  Preferential Lane Periods of Operation Regulatory Signs (R3-11 Series and R3-14 Series)
   487
Section 2G.06  Preferential Lane Advance Regulatory Signs (R3-12, R3-12c, R3-12f, R3-15, R3-15a, and R3-15d)
   489
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)
   490
Section 2G.08  Warning Signs on Median Barriers for Preferential Lanes
   490
Section 2G.09  High-Occupancy Vehicle (HOV) Plaque (W16-11P)
   491
Section 2G.10  Preferential Lane Guide Signs – General
   491
Section 2G.11  Guide Signs for Initial Entry Points to Preferential Lanes
   494
Section 2G.12  Guide Signs for Intermediate Entry Points to Preferential Lanes
   494
Section 2G.13  Guide Signs for Egress from Preferential Lanes to General-Purpose Lanes
   495
Section 2G.14  Guide Signs for Direct Entrances to Preferential Lanes from Another Highway
   496
Section 2G.15  Guide Signs for Direct Exits from Preferential Lanes to Another Highway
   496
Section 2G.16  Signs for Priced Managed Lanes – General
   497
Section 2G.17  Regulatory Signs for Priced Managed Lanes
   498
Section 2G.18  Guide Signs for Priced Managed Lanes
   499
Section 2G.101(CA)  Preferential Lane Enforcement Signing (SR50(CA)) Series
   500
Section 2G.102(CA)  Regulatory Signs for Preferential Lanes at Metered On-Ramps
   500

CHAPTER 2H.  GENERAL INFORMATION SIGNS
   535
Section 2H.01  Sizes of General Information Signs
   535
Section 2H.02  General Information Signs (I Series)
   535
Section 2H.03  Traffic Signal Speed Sign (I1-1)
   538
Section 2H.04  Miscellaneous Information Signs
   538
Section 2H.05  Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a)
   539
Section 2H.06  Enhanced Reference Location Signs (D10-4, D10-5)
   540
Section 2H.07  Auto Tour Route Signs
   541
Section 2H.08  Acknowledgment Signs
   541

CHAPTER 2I.  GENERAL SERVICE SIGNS
   551
Section 2I.01  Sizes of General Service Signs
   551
Section 2I.02  General Service Signs for Conventional Roads
   551
Section 2I.03  General Service Signs for Freeways and Expressways
   552
Section 2I.04  Interstate Oasis Signing
   562
Section 2I.05  Rest Area and Other Roadside Area Signs 563  
Section 2I.06  Brake Check Area Signs (D5-13 and D5-14) 565  
Section 2I.07  Chain-Up Area Signs (D5-15 and D5-16) 565  
Section 2I.08  Tourist Information and Welcome Center Signs 565  
Section 2I.09  Radio Information Signing 568  
Section 2I.10  TRAVEL INFO CALL 511 Signs (D12-5 and D12-5a) 570  
Section 2I.11  Carpool and Ridesharing Signing 571  

CHAPTER 2J.  SPECIFIC SERVICE SIGNS 583  
Section 2J.01  Eligibility 583  
Section 2J.02  Application 587  
Section 2J.03  Logos and Logo Sign Panels 588  
Section 2J.04  Number and Size of Signs and Logo Sign Panels 589  
Section 2J.05  Size of Lettering 590  
Section 2J.06  Signs at Interchanges 590  
Section 2J.07  Single-Exit Interchanges 590  
Section 2J.08  Double-Exit Interchanges 591  
Section 2J.09  Specific Service Trailblazer Signs 592  
Section 2J.10  Signs at Intersections 593  
Section 2J.11  Signing Policy 593  
Section 2J.101(CA)  Signs at Ramps 594  

CHAPTER 2K.  TOURIST-ORIENTED DIRECTIONAL SIGNS 601  
Section 2K.01  Purpose and Application 601  
Section 2K.02  Design 601  
Section 2K.03  Style and Size of Lettering 602  
Section 2K.04  Arrangement and Size of Signs 602  
Section 2K.05  Advance Signs 603  
Section 2K.06  Sign Locations 603  
Section 2K.07  State Policy 603  

CHAPTER 2L.  CHANGEABLE MESSAGE SIGNS 609  
Section 2L.01  Description of Changeable Message Signs 609  
Section 2L.02  Applications of Changeable Message Signs 609  
Section 2L.03  Legibility and Visibility of Changeable Message Signs 611  
Section 2L.04  Design Characteristics of Changeable Message Signs 611  
Section 2L.05  Message Length and Units of Information 613  
Section 2L.06  Installation of Permanent Changeable Message Signs 614  
Section 2L.101(CA)  Extinguishable Message Signs 614  

CHAPTER 2M.  RECREATIONAL AND CULTURAL INTEREST AREA SIGNS 615  
Section 2M.01  Scope 615  
Section 2M.02  Application of Recreational and Cultural Interest Area Signs 615  
Section 2M.03  Regulatory and Warning Signs 621  
Section 2M.04  General Design Requirements for Recreational and Cultural Interest Area Symbol Guide Signs 621  
Section 2M.05  Symbol Sign Sizes 621  
Section 2M.06  Use of Educational Plaques 621  

Table of Contents  
Revised March 9, 2018
### Table of Contents

**Chapter 2M. Use of Prohibitive Circle and Diagonal Slash for Non-Road Applications**
- Section 2M.07 Use of Prohibitive Circle and Diagonal Slash for Non-Road Applications
- Section 2M.08 Placement of Recreational and Cultural Interest Area Symbol Signs
- Section 2M.09 Destination Guide Signs
- Section 2M.10 Memorial or Dedication Signing
- Section 2M.101(CA) Historical Landmark Signs (G13-1(CA), G13-2(CA) and G14(CA))
- Section 2M.102(CA) POINT OF HISTORICAL INTEREST Sign (G15(CA))
- Section 2M.103(CA) Historic Route Signs (SG2(CA), SG2A(CA), S18(CA) and S25(CA))
- Section 2M.104(CA) Historic Bridge Signs (S29(CA), S29-1(CA) and S29-2(CA))

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

**Part 3. Markings**

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

**Chapter 3B. Pavement and Curb Markings**
- Section 3B.01 Yellow Center Line Pavement Markings and Warrants
- Section 3B.02 No-Passing Zone Pavement Markings and Warrants
- Section 3B.03 Other Yellow Longitudinal Pavement Markings
- Section 3B.04 White Lane Line Pavement Markings and Warrants
- Section 3B.05 Other White Longitudinal Pavement Markings
- Section 3B.06 Edge Line Pavement Markings
- Section 3B.07 Warrants for Use of Edge Lines
- Section 3B.08 Extensions Through Intersections or Interchanges
- Section 3B.09 Lane-Reduction Transition Markings
- Section 3B.10 Approach Markings for Obstructions
- Section 3B.11 Raised Pavement Markers – General
- Section 3B.12 Raised Pavement Markers as Vehicle Positioning Guides with Other Longitudinal Markings
- Section 3B.13 Raised Pavement Markers Supplementing Other Markings
- Section 3B.14 Raised Pavement Markers Substituting for Pavement Markings
- Section 3B.15 Transverse Markings
- Section 3B.16 Stop and Yield Lines
- Section 3B.17 Do Not Block Intersection Markings
Section 3B.18  Crosswalk Markings 682
Section 3B.19  Parking Space Markings 685
Section 3B.20  Pavement Word, Symbol, and Arrow Markings 686
Section 3B.21  Speed Measurement Markings 690
Section 3B.22  Speed Reduction Markings 691
Section 3B.23  Curb Markings 691
Section 3B.24  Chevron and Diagonal Crosshatch Markings 693
Section 3B.25  Speed Hump Markings 694
Section 3B.26  Advance Speed Hump Markings 694
Section 3B.101(CA)  Turnouts 694

CHAPTER 3C.  ROUNDABOUT MARKINGS 769

Section 3C.01  General 769
Section 3C.02  White Lane Line Pavement Markings for Roundabouts 769
Section 3C.03  Edge Line Pavement Markings for Roundabout Circulatory Roadways 769
Section 3C.04  Yield Lines for Roundabouts 770
Section 3C.05  Crosswalk Markings at Roundabouts 770
Section 3C.06  Word, Symbol, and Arrow Pavement Markings for Roundabouts 770
Section 3C.07  Markings for Other Circular Intersections 770

CHAPTER 3D  MARKINGS FOR PREFERENTIAL LANES 785

Section 3D.01  Preferential Lane Word and Symbol Markings 785
Section 3D.02  Preferential Lane Longitudinal Markings for Motor Vehicles 786

CHAPTER 3E.  MARKINGS FOR TOLL PLAZAS 795

Section 3E.01  Markings for Toll Plazas 795

CHAPTER 3F  DELINEATORS 797

Section 3F.01  Delineators 797
Section 3F.02  Delineator Design 797
Section 3F.03  Delineator Application 797
Section 3F.04  Delineator Placement and Spacing 798
Section 3F.101(CA)  Culvert Markers 800
Section 3F.102(CA)  Emergency Passageway Marker 800
Section 3F.103(CA)  Narrow Bridge Signing and Marking 800
Section 3F.104(CA)  Median Barrier Delineation 801

CHAPTER 3G  COLORED PAVEMENTS 809

Section 3G.01  General 809

CHAPTER 3H  CHANNELIZING DEVICES USED FOR EMPHASIS OF PAVEMENT MARKING PATTERNS 811

Section 3H.01  Channelizing Devices 811
CHAPTER 3I  ISLANDS  813
Section 3I.01  General  813
Section 3I.02  Approach-End Treatment  813
Section 3I.03  Island Marking Application  813
Section 3I.04  Island Marking Colors  814
Section 3I.05  Island Delineation  814
Section 3I.06  Pedestrian Islands and Medians  814

CHAPTER 3J  RUMBLE STRIP MARKINGS  815
Section 3J.01  Longitudinal Rumble Strip Markings  815
Section 3J.02  Transverse Rumble Strip Markings  815

PART 4  HIGHWAY TRAFFIC SIGNALS  817
CHAPTER 4A  GENERAL  817
Section 4A.01  Types  817
Section 4A.02  Definitions Relating to Highway Traffic Signals  817

CHAPTER 4B  TRAFFIC CONTROL SIGNALS—GENERAL  819
Section 4B.01  General  819
Section 4B.02  Basis of Installation or Removal of Traffic Control Signals  819
Section 4B.03  Advantages and Disadvantages of Traffic Control Signals  819
Section 4B.04  Alternatives to Traffic Control Signals  820
Section 4B.05  Adequate Roadway Capacity  820
Section 4B.101(CA)  Traffic Signal Development Procedures – Introduction  821
Section 4B.102(CA)  Project Report  821
Section 4B.103(CA)  Submittals  822
Section 4B.104(CA)  Financing  822
Section 4B.105(CA)  Design Cost  822
Section 4B.106(CA)  Construction Costs - Conventional Highways  823
Section 4B.107(CA)  Construction Costs – Freeways  824
Section 4B.108(CA)  Roadway Improvements by Local Agencies  825
Section 4B.109(CA)  Cooperative Agreements  825
Section 4B.110(CA)  Engineering Services for Local Agencies  825
Section 4B.111(CA)  Salvaged Electrical Equipment  825
Section 4B.112(CA)  Encroachment Permits  826
Section 4B.113(CA)  Modifications of Existing Signals  826
Section 4B.114(CA)  Signals on Poles Owned by Others  826

CHAPTER 4C  TRAFFIC CONTROL SIGNAL NEEDS STUDIES  827
Section 4C.01  Studies and Factors for Justifying Traffic Control Signals  827
Section 4C.02  Warrant 1, Eight-Hour Vehicular Volume  829
Section 4C.03  Warrant 2, Four-Hour Vehicular Volume  830
Section 4C.04  Warrant 3, Peak Hour  830
Section 4C.05  Warrant 4, Pedestrian Volume  831
Section 4C.06  Warrant 5, School Crossing  832
CHAPTER 4D TRAFFIC CONTROL SIGNAL FEATURES 851

Section 4D.01 General 851
Section 4D.02 Responsibility for Operation and Maintenance 851
Section 4D.03 Provisions for Pedestrians 852
Section 4D.04 Meaning of Vehicular Signal Indications 853
Section 4D.05 Application of Steady Signal Indications 855
Section 4D.06 Signal Indications – Design, Illumination, Color, and Shape 859
Section 4D.07 Size of Vehicular Signal Indications 859
Section 4D.08 Positions of Signal Indications Within a Signal Face – General 860
Section 4D.09 Positions of Signal Indications Within a Vertical Signal Face 861
Section 4D.10 Positions of Signal Indications Within a Horizontal Signal Face 862
Section 4D.11 Number of Signal Faces on an Approach 863
Section 4D.12 Visibility, Aiming, and Shielding of Signal Faces 864
Section 4D.13 Lateral Positioning of Signal Faces 865
Section 4D.14 Longitudinal Positioning of Signal Faces 866
Section 4D.15 Mounting Height of Signal Faces 866
Section 4D.16 Lateral Offset (Clearance) of Signal Faces 867
Section 4D.17 Signal Indications for Left-Turn Movements – General 867
Section 4D.18 Signal Indications for Permissive Only Mode Left-Turn Movements 868
Section 4D.19 Signal Indications for Protected Only Mode Left-Turn Movements 870
Section 4D.20 Signal Indications for Protected/Permissive Mode Left-Turn Movements 871
Section 4D.21 Signal Indications for Right-Turn Movements – General 873
Section 4D.22 Signal Indications for Permissive Only Mode Right-Turn Movements 875
Section 4D.23 Signal Indications for Protected Only Mode Right-Turn Movements 876
Section 4D.24 Signal Indications for Protected/Permissive Mode Right-Turn Movements 877
Section 4D.25 Signal Indications for Approaches With Shared Left-Turn/Right-Turn Lanes and No Through Movement 880
Section 4D.26 Yellow Change and Red Clearance Intervals 881
Section 4D.27 Preemption and Priority Control of Traffic Control Signals 883
Section 4D.28 Flashing Operation of Traffic Control Signals – General 887
Section 4D.29 Flashing Operation – Transition Into Flashing Mode 888
Section 4D.30 Flashing Operation – Signal Indications During Flashing Mode 888
Section 4D.31 Flashing Operation – Transition Out of Flashing Mode 889
Section 4D.32 Temporary and Portable Traffic Control Signals 889
Section 4D.33 Lateral Offset of Signal Supports and Cabinets 890
Section 4D.34 Use of Signs at Signalized Locations 891
Section 4D.35 Use of Pavement Markings at Signalized Locations 891
Section 4D.101(CA) Traffic Signal Design and Operations 892
Section 4D.102(CA) Signal Plan Schedules 892
Section 4D.103(CA) Vehicle Detectors 892
Section 4D.104(CA) Optional Use of Bicycle Signal Faces 893
Section 4D.105(CA) Bicycle/Motorcycle Detection 893
Section 4D.106(CA) Selection of Traffic Signal Operation 894
Section 4D.107(CA) Selection of Left-Turn Phasing 895
Section 4D.108(CA) Dual Left-Turn Phasing 895
CHAPTER 4E PEDESTRIAN CONTROL FEATURES

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

CHAPTER 4F PEDESTRIAN HYBRID BEACONS

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

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
Section 4G.02 Design of Emergency-Vehicle Traffic Control Signals
Section 4G.03 Operation of Emergency-Vehicle Traffic Control Signals
Section 4G.04 Emergency-Vehicle Hybrid Beacons

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

CHAPTER 4I TRAFFIC CONTROL SIGNALS FOR FREEWAY ENTRANCE RAMPS

Section 4I.01 Application of Freeway Entrance Ramp Control Signals
Section 4I.02 Design of Freeway Entrance Ramp Control Signals
Section 4I.03 Operation of Freeway Entrance Ramp Control Signals
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Section Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4J</td>
<td>4J.01</td>
<td>Application of Traffic Control for Movable Bridges</td>
<td>973</td>
</tr>
<tr>
<td></td>
<td>4J.02</td>
<td>Design and Location of Movable Bridge Signals and Gates</td>
<td>973</td>
</tr>
<tr>
<td></td>
<td>4J.03</td>
<td>Operation of Movable Bridge Signals and Gates</td>
<td>975</td>
</tr>
<tr>
<td>4K</td>
<td>4K.01</td>
<td>Traffic Signals at Toll Plazas</td>
<td>977</td>
</tr>
<tr>
<td></td>
<td>4K.02</td>
<td>Lane-Use Control Signals at or Near Toll Plazas</td>
<td>977</td>
</tr>
<tr>
<td></td>
<td>4K.03</td>
<td>Warning Beacons at Toll Plazas</td>
<td>977</td>
</tr>
<tr>
<td>4L</td>
<td>4L.01</td>
<td>General Design and Operation of Flashing Beacons</td>
<td>979</td>
</tr>
<tr>
<td></td>
<td>4L.02</td>
<td>Intersection Control Beacon</td>
<td>979</td>
</tr>
<tr>
<td></td>
<td>4L.03</td>
<td>Warning Beacon</td>
<td>981</td>
</tr>
<tr>
<td></td>
<td>4L.04</td>
<td>Speed Limit Sign Beacon</td>
<td>981</td>
</tr>
<tr>
<td></td>
<td>4L.05</td>
<td>Stop Beacon</td>
<td>982</td>
</tr>
<tr>
<td></td>
<td>4L.101(CA)</td>
<td>Flashing Beacons at School Crosswalks</td>
<td>982</td>
</tr>
<tr>
<td></td>
<td>4L.102(CA)</td>
<td>Flashing Beacons for Fire Stations</td>
<td>982</td>
</tr>
<tr>
<td></td>
<td>4L.103(CA)</td>
<td>Flashing Beacons at Bus Stops on Freeway Interchanges</td>
<td>983</td>
</tr>
<tr>
<td>4M</td>
<td>4M.01</td>
<td>Application of Lane-Use Control Signals</td>
<td>985</td>
</tr>
<tr>
<td></td>
<td>4M.02</td>
<td>Meaning of Lane-Use Control Signal Indications</td>
<td>985</td>
</tr>
<tr>
<td></td>
<td>4M.03</td>
<td>Design of Lane-Use Control Signals</td>
<td>986</td>
</tr>
<tr>
<td></td>
<td>4M.04</td>
<td>Operation of Lane-Use Control Signals</td>
<td>987</td>
</tr>
<tr>
<td>4N</td>
<td>4N.01</td>
<td>Application of In-Roadway Lights</td>
<td>989</td>
</tr>
<tr>
<td></td>
<td>4N.02</td>
<td>In-Roadway Warning Lights at Crosswalks</td>
<td>989</td>
</tr>
<tr>
<td></td>
<td>4N.101(CA)</td>
<td>In-Roadway Warning Lights at Crosswalks Financing and Maintenance-State Highways</td>
<td>991</td>
</tr>
<tr>
<td>5</td>
<td>5A.01</td>
<td>Function</td>
<td>993</td>
</tr>
<tr>
<td></td>
<td>5A.02</td>
<td>Application</td>
<td>993</td>
</tr>
<tr>
<td></td>
<td>5A.03</td>
<td>Design</td>
<td>994</td>
</tr>
<tr>
<td></td>
<td>5A.04</td>
<td>Placement</td>
<td>994</td>
</tr>
<tr>
<td>5B</td>
<td>5B.01</td>
<td>Introduction</td>
<td>997</td>
</tr>
<tr>
<td></td>
<td>5B.02</td>
<td>STOP and YIELD Signs (R1-1 and R1-2)</td>
<td>997</td>
</tr>
<tr>
<td></td>
<td>5B.03</td>
<td>Speed Limit Signs (R2 Series)</td>
<td>997</td>
</tr>
</tbody>
</table>

Table of Contents

November 7, 2014
## Table of Contents

**Section 5B.04** Traffic Movement and Prohibition Signs (R3, R4, R5, R6, R9, R10, R11, R12, R13, and R14 Series) 997
**Section 5B.05** Parking Signs (R8 Series) 997
**Section 5B.06** Other Regulatory Signs 998

### CHAPTER 5C  WARNING SIGNS 999

**Section 5C.01** Introduction 999
**Section 5C.02** Horizontal Alignment Signs (W1-1 through W1-8) 999
**Section 5C.03** Intersection Warning Signs (W2-1 through W2-6) 999
**Section 5C.04** Stop Ahead and Yield Ahead Signs (W3-1, W3-2) 999
**Section 5C.05** NARROW BRIDGE Sign (W5-2) 999
**Section 5C.06** ONE LANE BRIDGE Sign (W5-3) 999
**Section 5C.07** Hill Sign (W7-1) 1000
**Section 5C.08** PAVEMENT ENDS Sign (W8-3) 1000
**Section 5C.09** Vehicular Traffic Warning and Non-Vehicular Warning Signs (W11 Series and W8-6) 1000
**Section 5C.10** Advisory Speed Plaque (W13-1P) 1000
**Section 5C.11** DEAD END or NO OUTLET Signs (W14-1, W14-1a, W14-2, W14-2a) 1000
**Section 5C.12** NO TRAFFIC SIGNS Sign (W18-1) 1001
**Section 5C.13** Other Warning Signs 1001
**Section 5C.14** Object Markers and Barricades 1001

### CHAPTER 5D  GUIDE SIGNS 1005

**Section 5D.01** Introduction 1005

### CHAPTER 5E  MARKINGS 1007

**Section 5E.01** Introduction 1007
**Section 5E.02** Center Line Markings 1007
**Section 5E.03** Edge Line Markings 1007
**Section 5E.04** Delineators 1007
**Section 5E.05** Other Markings 1007

### CHAPTER 5F  TRAFFIC CONTROL FOR HIGHWAY-RAIL GRADE CROSSINGS 1009

**Section 5F.01** Introduction 1009
**Section 5F.02** Grade Crossing (Crossbuck) Sign and Number of Tracks Plaque (R15-1, R15-2P) 1009
**Section 5F.03** Grade Crossing Advance Warning Signs (W10 Series) 1009
**Section 5F.04** STOP and YIELD Signs (R1-1, R1-2) 1009
**Section 5F.05** Pavement Markings 1010
**Section 5F.06** Other Traffic Control Devices 1010

### CHAPTER 5G  TEMPORARY TRAFFIC CONTROL ZONES 1011

**Section 5G.01** Introduction 1011
**Section 5G.02** Applications 1011
**Section 5G.03** Channelization Devices 1011
**Section 5G.04** Markings 1012
**Section 5G.05** Other Traffic Control Devices 1012
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>5H</td>
<td>5H.01</td>
<td>Introduction</td>
<td>1013</td>
</tr>
<tr>
<td>6</td>
<td>6A.01</td>
<td>General</td>
<td>1015</td>
</tr>
<tr>
<td>6B</td>
<td>6B.01</td>
<td>Fundamental Principles of Temporary Traffic Control</td>
<td>1017</td>
</tr>
<tr>
<td>6C</td>
<td>6C.01</td>
<td>Temporary Traffic Control Plans</td>
<td>1021</td>
</tr>
<tr>
<td></td>
<td>6C.02</td>
<td>Temporary Traffic Control Zones</td>
<td>1023</td>
</tr>
<tr>
<td></td>
<td>6C.03</td>
<td>Components of Temporary Traffic Control Zones</td>
<td>1023</td>
</tr>
<tr>
<td></td>
<td>6C.04</td>
<td>Advance Warning Area</td>
<td>1024</td>
</tr>
<tr>
<td></td>
<td>6C.05</td>
<td>Transition Area</td>
<td>1024</td>
</tr>
<tr>
<td></td>
<td>6C.06</td>
<td>Activity Area</td>
<td>1024</td>
</tr>
<tr>
<td></td>
<td>6C.07</td>
<td>Termination Area</td>
<td>1025</td>
</tr>
<tr>
<td></td>
<td>6C.08</td>
<td>Tapers</td>
<td>1026</td>
</tr>
<tr>
<td></td>
<td>6C.09</td>
<td>Detours and Diversions</td>
<td>1027</td>
</tr>
<tr>
<td></td>
<td>6C.10</td>
<td>One-Lane, Two-Way Traffic Control</td>
<td>1027</td>
</tr>
<tr>
<td></td>
<td>6C.11</td>
<td>Flagger Method of One-Lane, Two-Way Traffic Control</td>
<td>1027</td>
</tr>
<tr>
<td></td>
<td>6C.12</td>
<td>Flag Transfer Method of One-Lane, Two-Way Traffic Control</td>
<td>1028</td>
</tr>
<tr>
<td></td>
<td>6C.13</td>
<td>Pilot Car Method of One-Lane, Two-Way Traffic Control</td>
<td>1028</td>
</tr>
<tr>
<td></td>
<td>6C.14</td>
<td>Temporary Traffic Control Signal Method of One-Lane, Two-Way Traffic Control</td>
<td>1028</td>
</tr>
<tr>
<td></td>
<td>6C.15</td>
<td>Stop or Yield Control Method of One-Lane, Two-Way Traffic Control</td>
<td>1028</td>
</tr>
<tr>
<td>6D</td>
<td>6D.01</td>
<td>Pedestrian Considerations</td>
<td>1035</td>
</tr>
<tr>
<td></td>
<td>6D.02</td>
<td>Accessibility Considerations</td>
<td>1037</td>
</tr>
<tr>
<td></td>
<td>6D.03</td>
<td>Worker Safety Considerations</td>
<td>1038</td>
</tr>
<tr>
<td></td>
<td>6D.101(CA)</td>
<td>Bicycle Considerations</td>
<td>1040</td>
</tr>
<tr>
<td>6E</td>
<td>6E.01</td>
<td>Qualifications for Flaggers</td>
<td>1041</td>
</tr>
<tr>
<td></td>
<td>6E.02</td>
<td>High-Visibility Safety Apparel</td>
<td>1041</td>
</tr>
<tr>
<td></td>
<td>6E.03</td>
<td>Hand-Signaling Devices</td>
<td>1042</td>
</tr>
<tr>
<td></td>
<td>6E.04</td>
<td>Automated Flagger Assistance Devices</td>
<td>1043</td>
</tr>
<tr>
<td></td>
<td>6E.05</td>
<td>STOP/SLOW Automated Flagger Assistance Devices</td>
<td>1044</td>
</tr>
<tr>
<td></td>
<td>6E.06</td>
<td>Red/Yellow Lens Automated Flagger Assistance Devices</td>
<td>1046</td>
</tr>
<tr>
<td></td>
<td>6E.07</td>
<td>Flagger Procedures</td>
<td>1047</td>
</tr>
<tr>
<td></td>
<td>6E.08</td>
<td>Flagger Stations</td>
<td>1048</td>
</tr>
</tbody>
</table>
# CHAPTER 6F  TEMPORARY TRAFFIC CONTROL ZONE DEVICES  

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>6F.01</td>
<td>Types of Devices</td>
</tr>
<tr>
<td>6F.02</td>
<td>General Characteristics of Signs</td>
</tr>
<tr>
<td>6F.03</td>
<td>Sign Placement</td>
</tr>
<tr>
<td>6F.04</td>
<td>Sign Maintenance</td>
</tr>
<tr>
<td>6F.05</td>
<td>Regulatory Sign Authority</td>
</tr>
<tr>
<td>6F.06</td>
<td>Regulatory Sign Design</td>
</tr>
<tr>
<td>6F.07</td>
<td>Regulatory Sign Applications</td>
</tr>
<tr>
<td>6F.08</td>
<td>ROAD (STREET) CLOSED Sign (R11-2)</td>
</tr>
<tr>
<td>6F.09</td>
<td>Local Traffic Only Signs (R11-3a, R11-4)</td>
</tr>
<tr>
<td>6F.10</td>
<td>Weight Limit Signs (R12-1, R12-2, R12-5)</td>
</tr>
<tr>
<td>6F.11</td>
<td>STAY IN LANE Sign (R4-9)</td>
</tr>
<tr>
<td>6F.12</td>
<td>Work Zone and Higher Fines Signs and Plaques</td>
</tr>
<tr>
<td>6F.13</td>
<td>PEDESTRIAN CROSSWALK Sign (R9-8)</td>
</tr>
<tr>
<td>6F.14</td>
<td>SIDEWALK CLOSED Signs (R9-9, R9-10, R9-11, R9-11a)</td>
</tr>
<tr>
<td>6F.15</td>
<td>Special Regulatory Signs</td>
</tr>
<tr>
<td>6F.16</td>
<td>Warning Sign Function, Design, and Application</td>
</tr>
<tr>
<td>6F.17</td>
<td>Position of Advance Warning Signs</td>
</tr>
<tr>
<td>6F.18</td>
<td>ROAD (STREET) WORK Sign (W20-1)</td>
</tr>
<tr>
<td>6F.19</td>
<td>DETOUR Sign (W20-2)</td>
</tr>
<tr>
<td>6F.20</td>
<td>ROAD (STREET) CLOSED Sign (W20-3)</td>
</tr>
<tr>
<td>6F.21</td>
<td>ONE LANE ROAD Sign (W20-4)</td>
</tr>
<tr>
<td>6F.22</td>
<td>Lane(s) Closed Signs (W20-5, W20-5a)</td>
</tr>
<tr>
<td>6F.23</td>
<td>CENTER LANE CLOSED AHEAD Sign (W9-3)</td>
</tr>
<tr>
<td>6F.24</td>
<td>Lane Ends Sign (W4-2)</td>
</tr>
<tr>
<td>6F.25</td>
<td>ON RAMP Plaque (W13-4P)</td>
</tr>
<tr>
<td>6F.26</td>
<td>RAMP NARROWS Sign (W5-4)</td>
</tr>
<tr>
<td>6F.27</td>
<td>SLOW TRAFFIC AHEAD Sign (W23-1)</td>
</tr>
<tr>
<td>6F.28</td>
<td>EXIT OPEN and EXIT CLOSED Signs (E5-2, E5-2a)</td>
</tr>
<tr>
<td>6F.29</td>
<td>EXIT ONLY Sign (E5-3)</td>
</tr>
<tr>
<td>6F.30</td>
<td>NEW TRAFFIC PATTERN AHEAD Sign (W23-2)</td>
</tr>
<tr>
<td>6F.31</td>
<td>Flagger Signs (W20-7, W20-7a)</td>
</tr>
<tr>
<td>6F.32</td>
<td>Two-Way Traffic Sign (W6-3)</td>
</tr>
<tr>
<td>6F.33</td>
<td>Workers Signs (W21-1, W21-1a)</td>
</tr>
<tr>
<td>6F.34</td>
<td>FRESH OIL (TAR) Sign (W21-2)</td>
</tr>
<tr>
<td>6F.35</td>
<td>ROAD MACHINERY AHEAD Sign (W21-3)</td>
</tr>
<tr>
<td>6F.36</td>
<td>Motorized Traffic Signs (W8-6, W11-10)</td>
</tr>
<tr>
<td>6F.37</td>
<td>Shoulder Work Signs (W21-5, W21-5a, W21-5b)</td>
</tr>
<tr>
<td>6F.38</td>
<td>SURVEY CREW Sign (W21-6)</td>
</tr>
<tr>
<td>6F.39</td>
<td>UTILITY WORK Sign (W21-7)</td>
</tr>
<tr>
<td>6F.40</td>
<td>Signs for Blasting Areas</td>
</tr>
<tr>
<td>6F.41</td>
<td>BLASTING ZONE AHEAD Sign (W22-1)</td>
</tr>
<tr>
<td>6F.42</td>
<td>TURN OFF 2-WAY RADIO AND CELL PHONE Sign (W22-2)</td>
</tr>
<tr>
<td>6F.43</td>
<td>END BLASTING ZONE Sign (W22-3)</td>
</tr>
<tr>
<td>6F.44</td>
<td>Shoulder Signs and Plaque (W8-4, W8-9, W8-17, and W8-17P)</td>
</tr>
<tr>
<td>6F.45</td>
<td>UNEVEN LANES Sign (W8-11)</td>
</tr>
<tr>
<td>6F.46</td>
<td>STEEL PLATE AHEAD Sign (W8-24)</td>
</tr>
<tr>
<td>6F.47</td>
<td>NO CENTER LINE Sign (W8-12)</td>
</tr>
<tr>
<td>6F.48</td>
<td>Reverse Curve Signs (W1-4 Series)</td>
</tr>
<tr>
<td>6F.49</td>
<td>Double Reverse Curve Signs (W24-1 Series)</td>
</tr>
<tr>
<td>6F.50</td>
<td>Other Warning Signs</td>
</tr>
<tr>
<td>6F.51</td>
<td>Special Warning Signs</td>
</tr>
</tbody>
</table>
Section 6F.52  Advisory Speed Plaque (W13-1P) 1069
Section 6F.53  Supplementary Distance Plaque (W7-3aP) 1069
Section 6F.54  Motorcycle Plaque (W8-15P) 1069
Section 6F.55  Guide Signs 1069
Section 6F.56  ROAD WORK NEXT XX MILES Sign (G20-1) 1070
Section 6F.57  END ROAD WORK Sign (G20-2) 1070
Section 6F.58  PILOT CAR FOLLOW ME Sign (G20-4) 1070
Section 6F.59  Detour Signs (M4-8, M4-8a, M4-8b, M4-9, M4-9a, M4-9b, M4-9c, and M4-10) 1071
Section 6F.60  Portable Changeable Message Signs 1071
Section 6F.61  Arrow Boards 1074
Section 6F.62  High-Level Warning Devices (Flag Trees) 1076
Section 6F.63  Channelizing Devices 1077
Section 6F.64  Cones 1078
Section 6F.65  Tubular Markers 1079
Section 6F.66  Vertical Panels 1080
Section 6F.67  Drums 1081
Section 6F.68  Type 1, 2, or 3 Barricades 1081
Section 6F.69  Direction Indicator Barricades 1083
Section 6F.70  Temporary Traffic Barriers as Channelizing Devices 1083
Section 6F.71  Longitudinal Channelizing Devices 1083
Section 6F.72  Temporary Lane Separators 1084
Section 6F.73  Other Channelizing Devices 1084
Section 6F.74  Detectable Edging for Pedestrians 1085
Section 6F.75  Temporary Raised Islands 1085
Section 6F.76  Opposing Traffic Lane Divider and Sign (W6-4) 1086
Section 6F.77  Pavement Markings 1086
Section 6F.78  Temporary Markings 1087
Section 6F.79  Temporary Raised Pavement Markers 1088
Section 6F.80  Delineators 1088
Section 6F.81  Lighting Devices 1089
Section 6F.82  Floodlights 1089
Section 6F.83  Warning Lights 1089
Section 6F.84  Temporary Traffic Control Signals 1091
Section 6F.85  Temporary Traffic Barriers 1092
Section 6F.86  Crash Cushions 1093
Section 6F.87  Rumble Strips 1094
Section 6F.88  Screens 1095
Section 6F.101(CA)  LOOSE GRAVEL Sign (W8-7) 1095
Section 6F.102(CA)  NARROW LANE(S) Sign (C12(CA)) 1095
Section 6F.103(CA)  OPEN TRENCH Sign (C27(CA)) 1095
Section 6F.104(CA)  Moving Lane Closure Signs (W23-1 and SC10(CA), SC11(CA), SC13(CA), SC15(CA)) 1096
Section 6F.105(CA)  Object Markers 1096
Section 6F.106(CA)  Slow For The Cone Zone (SC19(CA) and SC20(CA)) Signs 1097
Section 6F.107(CA)  FRESH CONCRETE (C43(CA) Sign 1097
Section 6F.108(CA)  CAUTION FREQUENT STOPPING AND BACKING STAY BACK 100 FEET (SC21(CA)) Sign 1097
Section 6F.109(CA)  Construction Project Funding Identification Signs 1097

CHAPTER 6G  TYPE OF TEMPORARY TRAFFIC CONTROL ZONE ACTIVITIES

Section 6G.01  Typical Applications 1119
Section 6G.02  Work Duration 1119
Section 6G.03  Location of Work 1121
Section 6G.04  Modifications To Fulfill Special Needs 1121
Section 6G.05  Work Affecting Pedestrian and Bicycle Facilities 1122
Section 6G.06  Work Outside of the Shoulder 1123
Section 6G.07  Work on the Shoulder with No Encroachment 1123
Section 6G.08  Work on the Shoulder with Minor Encroachment 1124
Section 6G.09  Work Within the Median 1124
Section 6G.10  Work Within the Traveled Way of a Two-Lane Highway 1124
Section 6G.11  Work Within the Traveled Way of an Urban Street 1125
Section 6G.12  Work Within the Traveled Way of a Multi-Lane, Non-Access Controlled Highway 1126
Section 6G.13  Work Within the Traveled Way at an Intersection 1127
Section 6G.14  Work Within the Traveled Way of a Freeway or Expressway 1128
Section 6G.15  Two-Lane, Two-Way Traffic on One Roadway of a Normally Divided Highway 1129
Section 6G.16  Crossovers 1129
Section 6G.17  Interchanges 1129
Section 6G.18  Work in the Vicinity of a Grade Crossing 1130
Section 6G.19  Temporary Traffic Control During Nighttime Hours 1130

CHAPTER 6H  TYPICAL APPLICATIONS 1133

Section 6H.01  Typical Applications 1133

CHAPTER 6I  CONTROL OF TRAFFIC THROUGH TRAFFIC INCIDENT MANAGEMENT AREAS 1251

Section 6I.01  General 1251
Section 6I.02  Major Traffic Incidents 1252
Section 6I.03  Intermediate Traffic Incidents 1253
Section 6I.04  Minor Traffic Incidents 1253
Section 6I.05  Use of Emergency-Vehicle Lighting 1254

Section 6I.101(CA)  FLOODING AHEAD TURN AROUND DON’T DROWN Sign (W86(CA)) 1254
Section 6I.102(CA)  EMERGENCY SCENE AHEAD W90(CA) Sign 1254

PART 7  TRAFFIC CONTROL FOR SCHOOL AREAS 1257

CHAPTER 7A  GENERAL 1257

Section 7A.01  Need for Standards 1257
Section 7A.02  School Routes and Established School Crossings 1257
Section 7A.03  School Crossing Control Criteria 1259
Section 7A.04  Scope 1259

CHAPTER 7B  SIGNS 1261

Section 7B.01  Size of School Signs 1261
Section 7B.02  Illumination and Reflectorization 1261
Section 7B.03  Position of Signs 1261
Section 7B.04  Height of Signs 1261
Section 7B.05  Installation of Signs 1261
Section 7B.06  Lettering 1262
Section 7B.07  Sign Color for School Warning Signs 1262
Section 7B.08  School Sign (S1-1) and Plaques 1262
Section 7B.09  School Zone Sign (S1-1) and Plaques (S4-3P, S4-7P) & END SCHOOL ZONE Sign (S5-2) 1262
Section 7B.10  Higher Fines Zone Signs (R2-10, R2-11) and Plaques 1263
Table of Contents

CHAPTER 7B  SCHOOL CROSSINGS  

Section 7B.11 School Advance Crossing Assembly 1263
Section 7B.12 School Crossing Assembly 1264
Section 7B.13 School Bus Stop Ahead Sign (S3-1) 1265
Section 7B.14 SCHOOL BUS TURN AHEAD Sign (S3-2) 1265
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) 1265
Section 7B.16 Reduced School Speed Limit Ahead Sign (S4-5, S4-5a) 1268
Section 7B.17 Parking and Stopping Signs (R7 and R8 Series) 1268

CHAPTER 7C  MARKINGS  

Section 7C.01 Functions and Limitations 1283
Section 7C.02 Crosswalk Markings 1283
Section 7C.03 Pavement Word, Symbol, and Arrow Markings 1284

CHAPTER 7D  CROSSING SUPERVISION  

Section 7D.01 Types of Crossing Supervision 1287
Section 7D.02 Adult Crossing Guards 1287
Section 7D.03 Qualifications of Adult Crossing Guards 1288
Section 7D.04 Uniform of Adult Crossing Guards 1288
Section 7D.05 Operating Procedures for Adult Crossing Guards 1289
Section 7D.101(CA) School Safety Patrols 1289

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

CHAPTER 8A  GENERAL  

Section 8A.01 Introduction 1291
Section 8A.02 Use of Standard Devices, Systems, and Practices at Highway-Rail Grade Crossings 1292
Section 8A.03 Use of Standard Devices, Systems, and Practices at Highway-LRT Grade Crossings 1293
Section 8A.04 Uniform Provisions 1294
Section 8A.05 Grade Crossing Elimination 1294
Section 8A.06 Illumination at Grade Crossings 1294
Section 8A.07 Quiet Zone Treatments at Highway-Rail Grade Crossings 1295
Section 8A.08 Temporary Traffic Control Zones 1295
Section 8A.101(CA) Relation to Other Documents 1295

CHAPTER 8B  SIGNS AND MARKINGS  

Section 8B.01 Purpose 1297
Section 8B.02 Sizes of Grade Crossing Signs 1297
Section 8B.03 Grade Crossing (Crossbuck) Sign (R15-1) and Number of Tracks Plaque (R15-2P) at Active and Passive Grade Crossings 1297
Section 8B.04 Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings 1298
Section 8B.05 Use of STOP (R1-1) or YIELD (R1-2) Signs without Crossbuck Signs at Highway-LRT Grade Crossings 1300
Section 8B.06 Grade Crossing Advance Warning Signs (W10 Series) 1300
Section 8B.07 EXEMPT Grade Crossing Plaques (R15-3P, W10-1aP) 1301
Section 8B.08 Turn Restrictions During Preemption 1302
Section 8B.09  DO NOT STOP ON TRACKS Sign (R8-8) 1303
Section 8B.10  TRACKS OUT OF SERVICE Sign (R8-9) 1303
Section 8B.11  STOP HERE WHEN FLASHING Signs (R8-10, R8-10a) 1303
Section 8B.12  STOP HERE ON RED Signs (R10-6, R10-6a) 1303
Section 8B.13  Light Rail Transit Only Lane Signs (R15-4 Series) 1304
Section 8B.14  Do Not Pass Light Rail Transit Signs (R15-5, R15-5a) 1304
Section 8B.15  No Motor Vehicles On Tracks Signs (R15-6, R15-6a) 1304
Section 8B.16  Divided Highway with Light Rail Transit Crossing Signs (R15-7 Series) 1304
Section 8B.17  LOOK Sign (R15-8) 1305
Section 8B.18  Emergency Notification Sign (I-13) 1305
Section 8B.19  Light Rail Transit Approaching-Activated Blank-Out Warning Sign (W10-7) 1306
Section 8B.20  TRAINS MAY EXCEED 80 MPH Sign (W10-8) 1306
Section 8B.21  NO TRAIN HORN Sign or Plaque (W10-9, W10-9P) 1306
Section 8B.22  NO GATES OR LIGHTS Plaque (W10-13P) 1306
Section 8B.23  Low Ground Clearance Grade Crossing Sign (W10-5) 1306
Section 8B.24  Storage Space Signs (W10-11, W10-11a, W10-11b) 1307
Section 8B.25  Skewed Crossing Sign (W10-12) 1307
Section 8B.26  Light Rail Transit Station Sign (I-12) 1307
Section 8B.27  Pavement Markings 1307
Section 8B.28  Stop and Yield Lines 1308
Section 8B.29  Dynamic Envelope Markings 1308
Section 8B.101(CA)  Train Station Signs (I-7, G95F(CA), G95G(CA) and G97A(CA)) 1309
Section 8B.102(CA)  Trolley Crossing Signs (W82(CA) and W82-1(CA)) 1309

CHAPTER 8C  FLASHING-LIGHT SIGNALS, GATES, AND TRAFFIC CONTROL SIGNALS 1327

Section 8C.01  Introduction 1327
Section 8C.02  Flashing-Light Signals 1328
Section 8C.03  Flashing-Light Signals at Highway-LRT Grade Crossings 1329
Section 8C.04  Automatic Gates 1329
Section 8C.05  Use of Automatic Gates at LRT Grade Crossings 1330
Section 8C.06  Four-Quadrant Gate Systems 1330
Section 8C.07  Wayside Horn Systems 1332
Section 8C.08  Rail Traffic Detection 1332
Section 8C.09  Traffic Control Signals at or Near Highway-Rail Grade Crossings 1332
Section 8C.10  Traffic Control Signals at or Near Highway-LRT Grade Crossings 1334
Section 8C.11  Use of Traffic Control Signals for Control of LRT Vehicles at Grade Crossings 1335
Section 8C.12  Grade Crossings Within or In Close Proximity to Circular Intersections 1335
Section 8C.13  Pedestrian and Bicycle Signals and Crossings at LRT Grade Crossings 1336

CHAPTER 8D  PATHWAY GRADE CROSSINGS 1347

Section 8D.01  Purpose 1347
Section 8D.02  Use of Standard Devices, Systems, and Practices 1347
Section 8D.03  Pathway Grade Crossing Signs and Markings 1347
Section 8D.04  Stop Lines, Edge Lines, and Detectable Warnings 1347
Section 8D.05  Passive Devices for Pathway Grade Crossings 1348
Section 8D.06  Active Traffic Control Systems for Pathway Grade Crossings 1348
PART 9  TRAFFIC CONTROL FOR BICYCLE FACILITIES  

CHAPTER 9A  GENERAL

Section 9A.01 Requirements for Bicyclist Traffic Control Devices
Section 9A.02 Scope
Section 9A.03 Definitions Relating to Bicycles
Section 9A.04 Maintenance
Section 9A.05 Relation to Other Documents
Section 9A.06 Placement Authority
Section 9A.07 Meaning of Standard, Guidance, Option, and Support
Section 9A.08 Colors
Section 9A.101(CA) Traffic Controls for Bicycle Facilities at Rail Crossings

CHAPTER 9B  SIGNS

Section 9B.01 Application and Placement of Signs
Section 9B.02 Design of Bicycle Signs
Section 9B.03 STOP and YIELD Signs (R1-1, R1-2)
Section 9B.04 Bike Lane Signs and Plaques (R3-17, R3-17aP, R3-17bP)
Section 9B.05 BEGIN RIGHT TURN LANE YIELD TO BIKES Sign (R4-4)
Section 9B.06 Bicycles May Use Full Lane Sign (R4-11)
Section 9B.07 Bicycle WRONG WAY Sign and RIDE WITH TRAFFIC Plaque (R5-1b, R9-3cP)
Section 9B.08 NO MOTOR VEHICLES Sign (R5-3)
Section 9B.09 Selective Exclusion Signs
Section 9B.10 No Parking Bike Lane Signs (R7-9, R7-9a)
Section 9B.11 Bicycle Regulatory Signs (R9-5, R9-6, R10-4, R10-24, R10-25, and R10-26)
Section 9B.12 Shared-Use Path Restriction Sign (R9-7)
Section 9B.13 Bicycle Signal Actuation Sign (R10-22)
Section 9B.14 Other Regulatory Signs
Section 9B.15 Turn or Curve Warning Signs (W1 Series)
Section 9B.16 Intersection Warning Signs (W2 Series)
Section 9B.17 Bicycle Surface Condition Warning Sign (W8-10)
Section 9B.18 Bicycle Warning and Combined Bicycle/Pedestrian Signs (W11-1 and W11-15)
Section 9B.19 Other Bicycle Warning Signs
Section 9B.20 Bicycle Guide Signs (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c, D11-1, D11-1c)
Section 9B.21 Bicycle Route Signs (M1-8, M1-8a, M1-9)
Section 9B.22 Bicycle Route Sign Auxiliary Plaques
Section 9B.23 Bicycle Parking Area Sign (D4-3)
Section 9B.24 Reference Location Signs (D10-1 through D10-3) and Intermediate Reference Location Signs (D10-1a through D10-3a)
Section 9B.25 Mode-Specific Guide Signs for Shared-Use Paths (D11-1a, D11-2, D11-3, D11-4)
Section 9B.26 Object Markers
Section 9B.101(CA) Freeway Bicycle Signs (R5-10a, R5-10b, R5-10c, R44B(CA), R44C(CA))
Section 9B.102(CA) PASS Bicycle 3 FT MIN Sign (R117(CA))
Section 9B.103(CA) EXCEPT Bicycle Plaque (R118(CA))
Section 9B.104(CA) Signs on Overcrossing Structures

CHAPTER 9C  MARKINGS

Section 9C.01 Functions of Markings
Section 9C.02 General Principles
| Section 9C.03 | Marking Patterns and Colors on Shared-Use Paths | 1379 |
| Section 9C.04 | Markings For Bicycle Lanes | 1380 |
| Section 9C.05 | Bicycle Detector Symbol | 1384 |
| Section 9C.06 | Pavement Markings for Obstructions | 1384 |
| Section 9C.07 | Shared Lane Marking | 1384 |
| Section 9C.101(CA) | Barrier Posts on Class I Bikeways | 1385 |
| Section 9C.102(CA) | Class IV Bikeways | 1386 |

**CHAPTER 9D  SIGNALS**

| Section 9D.01 | Application | 1413 |
| Section 9D.02 | Signal Operations for Bicycles | 1413 |

**APPENDIX A1.  CONGRESSIONAL LEGISLATION**

**APPENDIX A2.  METRIC CONVERSIONS**
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1A-1</td>
<td>Process for Requesting and Conducting Experimentations for New Traffic Control Devices</td>
</tr>
<tr>
<td>Figure 1A-1(CA)</td>
<td>Process for Requesting and Conducting Experimentations for New Traffic Control Devices in California</td>
</tr>
<tr>
<td>Figure 1A-2</td>
<td>Process for Incorporating New Traffic Control Devices into the MUTCD</td>
</tr>
<tr>
<td>Figure 1A-101(CA)</td>
<td>Process for the Use of Traffic Control Devices in California Approved as Interim Approval (IA) by FHWA</td>
</tr>
<tr>
<td>Figure 2A-1</td>
<td>Examples of Enhanced Conspicuity for Signs</td>
</tr>
<tr>
<td>Figure 2A-2</td>
<td>Examples of Heights and Lateral Locations of Sign Installations</td>
</tr>
<tr>
<td>Figure 2A-2(CA)</td>
<td>Examples of Heights and Lateral Locations of Sign Installations</td>
</tr>
<tr>
<td>Figure 2A-3</td>
<td>Examples of Locations for Some Typical Signs at Intersections</td>
</tr>
<tr>
<td>Figure 2A-4</td>
<td>Relative Locations of Regulatory, Warning, and Guide Signs on an Intersection Approach</td>
</tr>
<tr>
<td>Figure 2B-1</td>
<td>STOP and YIELD Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-2</td>
<td>Unsignalized Pedestrian Crosswalk Signs</td>
</tr>
<tr>
<td>Figure 2B-3</td>
<td>Speed Limit and Photo Enforcement Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-3(CA)</td>
<td>Speed Limit and Photo Enforcement Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-4</td>
<td>Movement Prohibition and Lane Control Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-4(CA)</td>
<td>Movement Prohibition and Lane Control Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-5</td>
<td>Intersection Lane Control Sign Arrow Options for Roundabouts</td>
</tr>
<tr>
<td>Figure 2B-6</td>
<td>Center and Reversible Lane Control Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-7</td>
<td>Location of Reversible Two-Way Left-Turn Signs</td>
</tr>
<tr>
<td>Figure 2B-8</td>
<td>Jughandle Regulatory Signs</td>
</tr>
<tr>
<td>Figure 2B-9</td>
<td>Examples of Applications of Jughandle Regulatory and Guide Signing</td>
</tr>
<tr>
<td>Figure 2B-10</td>
<td>Passing, Keep Right, and Slow Traffic Signs</td>
</tr>
<tr>
<td>Figure 2B-10(CA)</td>
<td>Passing, Keep Right, and Slow Traffic Signs</td>
</tr>
<tr>
<td>Figure 2B-11</td>
<td>Selective Exclusion Signs</td>
</tr>
<tr>
<td>Figure 2B-11(CA)</td>
<td>Selective Exclusion Signs</td>
</tr>
<tr>
<td>Figure 2B-12</td>
<td>Locations of Wrong-Way Signing for Divided Highways with Median Widths of 30 Feet or Wider</td>
</tr>
<tr>
<td>Figure 2B-12(CA)</td>
<td>Locations of Wrong-Way Signing for Divided Highways</td>
</tr>
<tr>
<td>Figure 2B-13</td>
<td>ONE WAY and Divided Highway Crossing Signs</td>
</tr>
<tr>
<td>Figure 2B-14</td>
<td>Locations of ONE WAY Signs</td>
</tr>
<tr>
<td>Figure 2B-15</td>
<td>ONE WAY Signing for Divided Highways with Median Widths of 30 Feet or Wider</td>
</tr>
<tr>
<td>Figure 2B-16</td>
<td>ONE WAY Signing for Divided Highways with Median Widths Narrower Than 30 Feet</td>
</tr>
<tr>
<td>Figure 2B-17</td>
<td>ONE WAY Signing for Divided Highways with Median Widths Narrower Than 30 Feet and Separated Left-Turn Lanes</td>
</tr>
<tr>
<td>Figure 2B-18</td>
<td>Example of Application of Regulatory Signing and Pavement Markings at an Exit Ramp Termination to Deter Wrong-Way Entry</td>
</tr>
<tr>
<td>Figure 2B-18(CA)</td>
<td>Examples of Application of Regulatory Signing and Pavement Markings at an Exit Ramp Termination to Deter Wrong-Way Entry</td>
</tr>
<tr>
<td>Figure 2B-19</td>
<td>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</td>
</tr>
<tr>
<td>Figure 2B-20</td>
<td>Roundabout Signs and Plaques</td>
</tr>
<tr>
<td>Figure 2B-21</td>
<td>Example of Regulatory and Warning Signs for a Mini-Roundabout</td>
</tr>
</tbody>
</table>

List of Figures

November 7, 2014
List of Figures

Figure 2B-22  Example of Regulatory and Warning Signs for a One-Lane Roundabout
Figure 2B-23  Example of Regulatory and Warning Signs for a Two-Lane Roundabout with Consecutive Double Lefts
Figure 2B-24  Parking and Standing Signs and Plaques (R7 Series)
Figure 2B-25  Parking and Stopping Signs and Plaques (R8 Series)
Figure 2B-26  Pedestrian Signs and Plaques
Figure 2B-27  Traffic Signal Signs and Plaques
Figure 2B-28  Ramp Metering Signs
Figure 2B-28(CA)  Ramp Metering Signs
Figure 2B-29  Road Closed and Weight Limit Signs
Figure 2B-29(CA)  Road Closed and Weight Limit Signs
Figure 2B-30  Truck Signs
Figure 2B-30(CA)  Truck Signs
Figure 2B-31  Headlight Use Signs
Figure 2B-32  Other Regulatory Signs and Symbols
Figure 2B-32(CA)  Other Regulatory Signs and Symbols
Figure 2B-101(CA)  Example of Speed Zone Survey Sheet
Figure 2B-102(CA)  Example of Cumulative Speed Curve Sheet
Figure 2B-103(CA)  Example of Vehicle Speed Survey Sheet for City and County Through Highways, Arterials, and Collector Roads
Figure 2B-104(CA)  Example of Vehicle Speed Survey Sheet for (For 40 MPH and Under)
Figure 2B-105(CA)  U-Turn Signs for Signalized Intersections with Separate Turn Phase
Figure 2B-105(CA)  Example of Speed Zone Survey Sheet
Figure 2B-106(CA)  California Miscellaneous Regulatory Signs
Figure 2B-106(CA)  California Miscellaneous Regulatory Signs
Figure 2C-1  Horizontal Alignment Signs and Plaques
Figure 2C-1(CA)  Horizontal Alignment Signs and Plaques
Figure 2C-2  Example of Warning Signs for a Turn
Figure 2C-3  Example of Advisory Speed Signing for an Exit Ramp
Figure 2C-4  Vertical Grade Signs and Plaques
Figure 2C-4(CA)  Vertical Grade Signs and Plaques
Figure 2C-5  Miscellaneous Warning Signs
Figure 2C-5(CA)  Miscellaneous Warning Signs
Figure 2C-6  Roadway and Weather Condition and Advance Traffic Control Signs and Plaques
Figure 2C-6(CA)  Roadway and Weather Condition and Advance Traffic Control Signs and Plaques
Figure 2C-7  Reduced Speed Limit Ahead Signs
Figure 2C-8  Merging and Passing Signs and Plaques
Figure 2C-8(CA)  Merging and Passing Signs and Plaques
Figure 2C-9  Intersection Warning Signs and Plaques
Figure 2C-9(CA)  Intersection Warning Signs and Plaques
Figure 2C-10  Vehicular Traffic Warning Signs and Plaques
Figure 2C-10(CA)  Vehicular Traffic Warning Signs and Plaques
Figure 2C-11  Non-Vehicular Warning Signs
Figure 2C-11(CA)  Non-Vehicular Warning Signs
Figure 2C-12  Supplemental Warning Plaques
Figure 2C-12(CA)  Supplemental Warning Plaques
Figure 2C-13  Object Markers
Figure 2C-13(CA)  California Object Markers
Figure 2C-101(CA)  Determination of Comfortable Speed from Ball Bank Indicator Readings
Figure 2D-1  Examples of Color-Coded Destination Guide Signs
Figure 2D-2  Arrows for Use on Guide Signs
Figure 2D-2(CA)  Arrows for Use on Guide Signs  354
Figure 2D-3  Route Signs  356
Figure 2D-3(CA)  California Route Signs  356
Figure 2D-4  Route Sign Auxiliaries  357
Figure 2D-4(CA)  Route Sign Auxiliaries  357
Figure 2D-5  Advance Turn and Directional Arrow Auxiliary Signs  358
Figure 2D-5(CA)  Advance Turn and Directional Arrow Auxiliary Signs  358
Figure 2D-6  Illustration of Directional Assemblies and Other Route Signs (for One Direction of Travel Only)  359
Figure 2D-7  Destination and Distance Signs  363
Figure 2D-7(CA)  California Destination and Distance Signs  364
Figure 2D-8  Destination Signs for Roundabouts  365
Figure 2D-9  Examples of Guide Signs for Roundabouts  366
Figure 2D-10  Street Name and Parking Signs  368
Figure 2D-10(CA)  Street Name and Parking Signs  368
Figure 2D-11  Example of Interchange Crossroad Signing for a One-Lane Approach  369
Figure 2D-12  Example of Minor Interchange Crossroad Signing  370
Figure 2D-13  Examples of Multi-Lane Crossroad Signing for a Diamond Interchange  371
Figure 2D-14  Examples of Multi-Lane Crossroad Signing for a Partial Cloverleaf Interchange  372
Figure 2D-15  Examples of Multi-Lane Crossroad Signing for a Cloverleaf Interchange  373
Figure 2D-16  Example of Crossroad Signing for an Entrance Ramp with a Nearby Frontage Road  374
Figure 2D-17  Example of Weigh Station Signing  375
Figure 2D-17(CA)  Example of Weigh Station Signing  376
Figure 2D-18  Examples of Community Wayfinding Guide Signs  376
Figure 2D-19  Example of a Community Wayfinding Guide Sign System Showing Direction from a Freeway or Expressway  377
Figure 2D-20  Example of a Color-Coded Community Wayfinding Guide Sign System  378
Figure 2D-21  Crossover, Truck Lane, and Slow Vehicle Signs  379
Figure 2D-21(CA)  Crossover, Truck Lane, and Slow Vehicle Signs  379
Figure 2D-22  Examples of Use of the National Scenic Byways Sign  379
Figure 2D-101(CA)  California Miscellaneous Guide Signs  380
Figure 2E-1  Example of Guide Sign Spreading  415
Figure 2E-2  Pull-Through Signs  415
Figure 2E-2(CA)  California Pull-Through Signs  416
Figure 2E-3  Overhead Arrow-per-Lane Guide Sign for a Multi-Lane Exit with an Option Lane  416
Figure 2E-4  Overhead Arrow-per-Lane Guide Signs for a Two-Lane Exit to the Right with an Option Lane  417
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)  418
Figure 2E-6  Overhead Arrow-per-Lane Guide Signs for a Split with an Option Lane  419
Figure 2E-7  Diagrammatic Guide Sign for a Multi-Lane Exit with an Option Lane  420
Figure 2E-8  Diagrammatic Guide Signs for a Two-Lane Exit to the Right with an Option Lane (Through Lanes Curve to the Left)  421
Figure 2E-9  Diagrammatic Guide Signs for a Two-Lane Exit to the Right with an Option Lane (Through Lanes Curve to the Left)  422
Figure 2E-10  Diagrammatic Guide Signs for a Split with an Option Lane  423
Figure 2E-11  Example of Signing for a Two-Lane Intermediate or Minor Interchange Exit with an Option Lane and a Dropped Lane  424
Figure 2E-12  Example of Signing for a Two-Lane Intermediate or Minor Interchange Exit with Option and Auxiliary Lanes  425
Figure 2E-13  EXIT ONLY and LEFT Sign Panels  426
Figure 2E-13(CA)  EXIT ONLY and LEFT Sign Panels  426
Figure 2E-14  Guide Signs for a Split with Dedicated Lanes  427
Figure 2E-15  Guide Signs for a Single-Lane Exit to the Left with a Dropped Lane  428
List of Figures

November 7, 2014
Figure 2F-11  Examples of Guide Signs for a Mainline Toll Plaza on a Diverging Alignment from
Open-Road ETC Lanes 481
Figure 2G-1  Preferential Lane Regulatory Signs and Plaques 502
Figure 2G-1(CA)  Preferential Lane Regulatory Signs and Plaques 504
Figure 2G-2  Example of Signing for an Added Continuous-Access Contiguous or
Buffer-Separated HOV Lane 505
Figure 2G-3  Example of Signing for a General-Purpose Lane that Becomes a Continuous-Access
Contiguous or Buffer-Separated HOV Lane 506
Figure 2G-4  Examples of Warning Signs and Plaques Applicable Only to Preferential Lanes 507
Figure 2G-4(CA)  Examples of Warning Signs and Plaques Applicable Only to Preferential Lanes 507
Figure 2G-5  Example of an Overhead Advance Guide Sign for a Preferential Lane Entrance 508
Figure 2G-6  Examples of Overhead or Post-Mounted Preferential Lane Entrance Direction Signs 508
Figure 2G-6(CA)  Examples of Overhead or Post-Mounted Preferential Lane Entrance Direction Signs 509
Figure 2G-7  Entrance Gore Signs for Barrier-Separated Preferential Lanes 509
Figure 2G-8  Example of Signing for an Entrance to Access-Restricted HOV Lanes 510
Figure 2G-9  Example of Signing for an Intermediate Entry to a Barrier- or Buffer-Separated
HOV Lane 511
Figure 2G-10  Example of Signing for the Intermediate Entry to, Egress from, and End of
Access-Restricted HOV Lanes 512
Figure 2G-11  Examples of Barrier-Mounted Guide Signs for an Intermediate Egress from
Preferential Lanes 513
Figure 2G-12  Examples of Guide Signs for an Intermediate Egress from a Barrier- or
Buffer-Separated HOV Lane 514
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 515
Figure 2G-14  Exit Gore Sign for a Direct Exit from a Preferential Lane 516
Figure 2G-14(CA)  Advance Exit and Exit Gore Sign for a Direct Exit from a Preferential Lane 516
Figure 2G-15  Examples of Guide Signs for Direct HOV Lane Entrance and Exit Ramps 517
Figure 2G-15(CA)  Examples of Guide Signs for Direct HOV Lane Entrance and Exit Ramps 518
Figure 2G-16  Examples of Guide Signs for a Direct Access Ramp between HOV Lanes on
Separate Freeways 519
Figure 2G-17  Regulatory Signs for Managed Lanes 520
Figure 2G-18  Examples of Guide Signs for Entrances to Priced Managed Lanes 521
Figure 2G-19  Example of an Exit Destinations Sign for a Managed Lane 521
Figure 2G-20  Example of a Comparative Travel Time Information Sign for Preferential or
Managed Lanes 521
Figure 2G-21  Example of Signing for the Entrance to an Access-Restricted Priced Managed Lane
Where a General-Purpose Lane Becomes the Managed Lane 522
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 523
Figure 2G-23  Example of Signing for an Intermediate Entry to a Barrier- or Buffer-Separated
Priced Managed Lane 524
Figure 2G-24  Example of Signing for the Intermediate Entry to, Egress from, and End of
Access-Restricted Priced Managed Lanes 525
Figure 2G-25  Examples of Guide Signs for an Intermediate Egress from a Barrier- or
Buffer-Separated HOV Lane 526
Figure 2G-26  Examples of Guide Signs for Direct Managed Lane Entrance and Exit Ramps 527
Figure 2G-27  Examples of Guide Signs for a Direct Access Ramp between Managed Lanes on
Separate Freeways 528
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 529
Figure 2G-29  Examples of Guide Signs for Separate Entrance Ramps to General-Purpose and
Priced Managed Lanes from the Same Crossroad 530
Figure 2H-1  General Information and Miscellaneous Information Signs 544
List of Figures

Figure 2H-1(CA)  General Information and Miscellaneous Information Signs 544
Figure 2H-2  Reference Location Signs 545
Figure 2H-3  Intermediate Reference Location Signs 545
Figure 2H-4  Enhanced Reference Location Signs 546
Figure 2H-5  Examples of Acknowledgment Sign Designs 547

Figure 2H-5(CA)  Examples of Adopt-A-Highway Sign Designs 547
Figure 2I-1  General Service Signs and Plaques 572
Figure 2I-1(CA)  General Service Signs and Plaques 573

Figure 2I-2  Example of Next Services Plaque 574
Figure 2I-3  Examples of General Service Signs with and without Exit Numbering 574
Figure 2I-4  Examples of Interstate Oasis Signs and Plaques 575
Figure 2I-5  Rest Area and Other Roadside Area Signs 575
Figure 2I-5(CA)  Rest Area and Other Roadside Area Signs 575

Figure 2I-6  Brake Check Area and Chain-Up Area Signs 576
Figure 2I-6(CA)  Brake Check Area and Chain-Up Area Signs 576

Figure 2I-7  Examples of Tourist Information and Welcome Center Signs 576

Figure 2I-7(CA)  Examples of Tourist Information and Welcome Center Signs 577
Figure 2I-8  Radio, Telephone, and Carpool Information Signs 578
Figure 2I-8(CA)  Radio, Telephone, and Carpool Information Signs 579

Figure 2J-1  Examples of Specific Service Signs 595
Figure 2J-1(CA)  Examples of Specific Service Signs 596

Figure 2J-2  Examples of Specific Service Sign Locations 597
Figure 2J-3  Examples of Supplemental Messages on Logo Sign Panels 598

Figure 2J-3 (CA)  Examples of Supplemental Messages on Logo Sign Panels 598
Figure 2J-4  Examples of RV Access Supplemental Messages on Logo Sign Panels 598
Figure 2J-5  Examples of Specific Service Trailblazer Signs 598
Figure 2K-1  Examples of Tourist-Oriented Directional Signs 605

Figure 2K-1(CA)  Examples of Tourist-Oriented Directional Signs 606

Figure 2K-2  Examples of Intersection Approach Signs and Advance Signs for Tourist-Oriented
Directional Signs 607

Figure 2M-1  Examples of Use of Arrows, Educational Plaques, and Prohibitory Slashes 629
Figure 2M-1(CA)  Examples of Use of Arrows, Educational Plaques, and Prohibitory Slashes 629

Figure 2M-2  Examples of Recreational and Cultural Interest Area Guide Signs 630
Figure 2M-2(CA)  Examples of Recreational and Cultural Interest Area Guide Signs 631

Figure 2M-3  Arrangement, Height, and Lateral Position of Signs Located Within Recreational
and Cultural Interest Areas 632

Figure 2M-4  Examples of Symbol and Destination Guide Signing Layout 633
Figure 2M-5  Recreational and Cultural Interest Area Symbol Signs for General Applications 634
Figure 2M-6  Recreational and Cultural Interest Area Symbol Signs for Accommodations 635
Figure 2M-7  Recreational and Cultural Interest Area Symbol Signs for Services 635
Figure 2M-8  Recreational and Cultural Interest Area Symbol Signs for Land Recreation 636

Figure 2M-8(CA)  Recreational and Cultural Interest Area Symbol Signs for Land Recreation 636
Figure 2M-9  Recreational and Cultural Interest Area Symbol Signs for Water Recreation 637
Figure 2M-10  Recreational and Cultural Interest Area Symbol Signs for Winter Recreation 638

Figure 2M-10(CA)  Recreational and Cultural Interest Area Symbol Signs for Winter Recreation 638

Figure 2M-101(CA)  Memorial or Dedication Signing 639

Figure 2M-102(CA)  Prohibited Recreational and Cultural Interest Area Symbol Signs and Educational Plaque 640

Figure 2N-1  Emergency Management Signs 648

Figure 2A-101(CA)  Centerlines – 2 Lane Highways 652
Figure 2A-102(CA)  Lane Lines – Multilane Highways 653
Figure 2A-103(CA)  No Passing Zones – One Direction 654
Figure 2A-104(CA)  No Passing Zones – Two Direction 655
Figure 2A-105(CA)  Left Edge Lines for Divided Highways 656
Figure 3A-106(CA)  Right Edge Line and Right Edge Line Extension Through Intersections  657
Figure 3A-107(CA)  Median Islands  658
Figure 3A-108(CA)  Two-Way Left-Turn lanes  659
Figure 3A-109(CA)  Intersection Markings  660
Figure 3A-110(CA)  Freeway Exit and Entrance Ramp Channelizing Lines  661
Figure 3A-111(CA)  Lane Drop Markings  663
Figure 3A-112(CA)  Channelizing Line and Lane Line/Centerline Extensions  664
Figure 3A-113(CA)  Examples of Preferential Lane Lines  665
Figure 3B-1  Examples of Two-Lane, Two-Way Marking Applications  695
Figure 3B-2  Examples of Four-or-More Lane, Two-Way Marking Applications  696
Figure 3B-3  Examples of Three-Lane, Two-Way Marking Applications  697
Figure 3B-4  Method of Locating and Determining the Limits of No-Passing Zones at Curves  698
Figure 3B-5  Example of Application of Three-Lane, Two-Way Marking for Changing Direction of the Center Lane  699
Figure 3B-6  Example of Reversible Lane Marking Application  700
Figure 3B-7  Example of Two-Way Left-Turn Lane Marking Applications  701
Figure 3B-7(CA)  Example of Two-Way Left-Turn Lane Marking Applications  702
Figure 3B-8  Examples of Dotted Line and Channelizing Line Applications for Exit Ramp Markings  703
Figure 3B-8(CA)  Examples of Dotted Line and Channelizing Line Applications for Exit Ramp Markings  705
Figure 3B-9  Examples of Dotted Line and Channelizing Line Applications for Entrance Ramp Markings  708
Figure 3B-9(CA)  Examples of Dotted Line and Channelizing Line Applications for Entrance Ramp Markings  710
Figure 3B-10  Examples of Applications of Freeway and Expressway Lane-Drop Markings  712
Figure 3B-10(CA)  Examples of Applications of Freeway and Expressway Lane-Drop Markings  717
Figure 3B-11  Examples of Applications of Conventional Road Lane-Drop Markings  718
Figure 3B-12  Example of Solid Double White Lines Used to Prohibit Lane Changing  720
Figure 3B-13  Examples of Line Extensions through Intersections  721
Figure 3B-14  Examples of Applications of Lane-Reduction Transition Markings  723
Figure 3B-14(CA)  Examples of Applications of Lane-Reduction Transition Markings  724
Figure 3B-15  Examples of Applications of Markings for Obstructions in the Roadway  727
Figure 3B-16  Recommended Yield Line Layouts  729
Figure 3B-17  Examples of Yield Lines at Unsignalized Midblock Crosswalks  730
Figure 3B-18  Examples of Crosswalk Enhancements at Uncontrolled Multilane Approaches  731
Figure 3B-18(CA)  Do Not Block Intersection Markings  732
Figure 3B-19  Examples of Crosswalk Markings  734
Figure 3B-19(CA)  Examples of Crosswalk Markings  734
Figure 3B-20  Example of Crosswalk Markings for an Exclusive Pedestrian Phase that Permits Diagonal Crossing  735
Figure 3B-21  Examples of Parking Space Markings  736
Figure 3B-21(CA)  Examples of Parking Space Markings  737
Figure 3B-22  International Symbol of Accessibility Parking Space Marking  738
Figure 3B-22(CA)  Examples of Disabled Persons Parking Symbol, Legend and Related Markings  739
Figure 3B-23  Example of Elongated Letters for Word Pavement Markings  741
Figure 3B-23(CA)  Example of Elongated Letters for Word Pavement Markings  742
Figure 3B-24  Examples of Standard Arrows for Pavement Markings  743
Figure 3B-24(CA)  Examples of Standard Arrows for Pavement Markings  745
Figure 3B-25  Examples of Elongated Route Shields for Pavement Markings  753
Figure 3B-26  Yield Ahead Triangle Symbols  753
Figure 3B-27  Examples of Lane-Use Control Word and Arrow Pavement Markings  754
Figure 3B-28  Example of the Application of Speed Reduction Markings  755
Figure 3B-29  Pavement Markings for Speed Humps without Crosswalks  756
List of Figures

Figure 3B-30  Pavement Markings for Speed Tables or Speed Humps with Crosswalks
Figure 3B-31  Advance Warning Markings for Speed Humps
Figure 3B-101(CA)  Examples of Left-Turn Channelization Markings
Figure 3B-102(CA)  Examples of Fire Hydrant Location Pavement Markings
Figure 3B-103(CA)  Examples of Intersection Markings
Figure 3B-104(CA)  Treatment of Divided Highway Illusion
Figure 3B-105(CA)  Examples of Signs and Markings for Highways Where Speed is Enforced by Aircraft
Figure 3B-106(CA)  Passing Lanes
Figure 3B-107(CA)  Examples of Signing and Marking Turnouts
Figure 3B-108(CA)  Electric Vehicle Charging Station Pavement Marking Details
Figure 3C-1  Example of Markings for Approach and Circulatory Roadways at a Roundabout
Figure 3C-2  Lane-Use Arrow Pavement Marking Options for Roundabout Approaches
Figure 3C-3  Example of Markings for a One-Lane Roundabout
Figure 3C-4  Example of Markings for a Two-Lane Roundabout with One- and Two-Lane Approaches
Figure 3C-5  Example of Markings for a Two-Lane Roundabout with One-Lane Exits
Figure 3C-6  Example of Markings for a Two-Lane Roundabout with Two-Lane Exits
Figure 3C-7  Example of Markings for a Two-Lane Roundabout with a Double Left Turn
Figure 3C-8  Example of Markings for a Two-Lane Roundabout with a Double Right Turn
Figure 3C-9  Example of Markings for a Two-Lane Roundabout with Consecutive Double Lefts
Figure 3C-10  Example of Markings for a Three-Lane Roundabout with Two- and Three-Lane Approaches
Figure 3C-11  Example of Markings for a Three-Lane Roundabout with Three-Lane Approaches
Figure 3C-12  Example of Markings for a Three-Lane Roundabout with Two-Lane Exits
Figure 3C-13  Example of Markings for Two Linked Roundabouts
Figure 3C-14  Example of Markings for a Diamond Interchange with Two Circular-Shaped Roundabout Ramp Terminals
Figure 3D-1  Markings for Barrier-Separated Preferential Lanes
Figure 3D-2  Markings for Buffer-Separated Preferential Lanes
Figure 3D-3  Markings for Contiguous Preferential Lanes
Figure 3D-4  Markings for Counter-Flow Preferential Lanes on Divided Highways
Figure 3D-101(CA)  Diamond Symbol (HOV Lane)
Figure 3F-1  Examples of Delineator Placement
Figure 3F-101(CA)  Examples of Delineators
Figure 3F-102(CA)  Examples of Delineator Placement When Used at Intersections, Islands, Ramps and Connectors
Figure 3F-103(CA)  Examples of Runaway Truck Ramp Signs and Markings
Figure 3F-104(CA)  Narrow Bridge Signs and Markings (One-Way and Two-Way Roadways)
Figure 3F-105(CA)  Examples of Median Barrier Delineation
Figure 3H-101(CA)  Example of Channelizers
Figure 3J-1  Examples of Longitudinal Rumble Strip Markings
Figure 4C-1  Warrant 2, Four-Hour Vehicular Volume
Figure 4C-2  Warrant 2, Four-Hour Vehicular Volume (70% Factor)
Figure 4C-3  Warrant 3, Peak Hour
Figure 4C-4  Warrant 3, Peak Hour (70% Factor)
Figure 4C-5  Warrant 4, Pedestrian Four-Hour Volume
Figure 4C-6  Warrant 4, Pedestrian Four-Hour Volume (70% Factor)
Figure 4C-7  Warrant 4, Pedestrian Peak Hour
Figure 4C-8  Warrant 4, Pedestrian Peak Hour (70% Factor)
Figure 4C-9  Warrant 9, Intersection Near a Grade Crossing (One Approach Lane at the Track Crossing)
Figure 4C-10  Warrant 9, Intersection Near a Grade Crossing (Two or More Approach Lanes at the Track Crossing)
List of Figures

Figure 4C-101(CA) Traffic Signal Warrants Worksheet 841
Figure 4C-102(CA) Traffic Count Worksheet 846
Figure 4C-103(CA) Traffic Signal Warrants Worksheet (Average Traffic Estimate Form) 847
Figure 4D-1 Example of U-Turn Signal Face 897
Figure 4D-2 Typical Arrangements of Signal Sections in Signal Faces That Do Not Control Turning Movements 897
Figure 4D-3 Recommended Vehicular Signal Faces for Approaches with Posted, Statutory, or 85th-Percentile Speed of 45 mph or Higher 898
Figure 4D-4 Lateral and Longitudinal Location of Primary Signal Faces 899
Figure 4D-5 Maximum Mounting Height of Signal Faces Located Between 40 Feet and 53 Feet from Stop Line 900
Figure 4D-6 Typical Position and Arrangements of Shared Signal Faces for Permissive Only Mode Left Turns 900
Figure 4D-7 Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Permissive Only Mode Left Turns 901
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 901
Figure 4D-9 Typical Positions and Arrangements of Shared Signal Faces for Protected Only Mode Left Turns 902
Figure 4D-10 Typical Position and Arrangements of Separate Signal Faces for Protected Only Mode Left Turns 903
Figure 4D-11 Typical Position and Arrangements of Shared Signal Faces for Protected/Permissive Mode Left Turns 903
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 904
Figure 4D-13 Typical Positions and Arrangements of Shared Signal Faces for Permissive Only Mode Right Turns 904
Figure 4D-14 Typical Position and Arrangements of Separate Signal Faces with Flashing Yellow Arrow for Permissive Only Mode Right Turns 905
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 905
Figure 4D-16 Typical Positions and Arrangements of Shared Signal Faces for Protected Only Mode Right Turns 906
Figure 4D-17 Typical Position and Arrangements of Separate Signal Faces for Protected Only Mode Right Turns 907
Figure 4D-18 Typical Positions and Arrangements of Shared Signal Faces for Protected/Permissive Mode Right Turns 908
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 909
Figure 4D-20 Signal Indications for Approaches with a Shared Left-Turn/Right-Turn Lane and No Through Movement 910
Figure 4D-101(CA) Left-Turn Phasing Methods (Phase Diagrams) 913
Figure 4D-102(CA) Typical Signal Layout at Offset Intersections, Signalized and Marked as a Single Intersection 914
Figure 4D-103(CA) Typical Signal Layout (Two Phase Operation) 918
Figure 4D-104(CA) Typical Signal Layout (Three Phase Operation) 919
Figure 4D-105(CA) Typical Signal Layout (Five Phase "Dual Left" Operation) 920
Figure 4D-106(CA) Typical Signal Layout (Six Phase "Opposing" Operation) 921
Figure 4D-107(CA) Typical Signal Layout (Eight Phase "Quad Left" Operation) 922
Figure 4D-108(CA) Typical Traffic Signal Installation 923
Figure 4D-109(CA) Diamond Interchange Timing Chart (Heavy Left-Turn – 200 vphpl or More – Using Two Controllers) 924
Figure 4D-110(CA) Diamond Interchange Timing Chart (Light Left-Turn – 200 vphpl or Less– Using Two Controllers) 925
List of Figures

Figure 4D-111(CA) Bicycle Detection Systems 926
Figure 4D-112(CA) Example of Bicycle Signal Face 929
Figure 4E-1 Typical Pedestrian Signal Indications 953
Figure 4E-2 Pedestrian Intervals 954
Figure 4E-3 Pushbutton Location Area 955
Figure 4E-4 Typical Pushbutton Locations 956
Figure 4F-1 Guidelines for the Installation of Pedestrian Hybrid Beacons on Low-Speed Roadways 962
Figure 4F-2 Guidelines for the Installation of Pedestrian Hybrid Beacons on High-Speed Roadways 962
Figure 4F-3 Sequence for a Pedestrian Hybrid Beacon 963
Figure 4G-1 Sequence for an Emergency-Vehicle Hybrid Beacon 968
Figure 4L-101(CA) Flashing Beacon at School Crossings Worksheet 984
Figure 4M-1 Left-Turn Lane-Use Control Signals 988
Figure 4M-101(CA) Example of Lane Control Signal Face 988
Figure 4N-101(CA) Typical Layout For In Roadway Warning Lights (IRWL's) 992
Figure 5B-1 Regulatory Signs on Low-Volume Roads 998
Figure 5C-1 Horizontal Alignment and Intersection Warning Signs and Plaques and Object Markers on Low-Volume Roads 1002
Figure 5C-2 Other Warning Signs and Plaques on Low-Volume Roads 1003
Figure 5C-2(CA) Other Warning Signs and Plaques on Low-Volume Roads 1004
Figure 5F-1 Highway-Rail Grade Crossing Signs and Plaques for Low-Volume Roads 1010
Figure 5G-1 Temporary Traffic Control Signs and Plaques on Low-Volume Roads 1012
Figure 6C-1 Component Parts of a Temporary Traffic Control Zone 1029
Figure 6C-2 Types of Tapers and Buffer Spaces 1030
Figure 6C-3 Example of a One-Lane, Two-Way Traffic Taper 1031
Figure 6E-1 Example of the Use of a STOP/SLOW Automated Flagger Assistance Device (AFAD) 1049
Figure 6E-2 Example of the Use of a Red/Yellow Lens Automated Flagger Assistance Device (AFAD) 1050
Figure 6E-3 Use of Hand-Signaling Devices by Flaggers 1051
Figure 6F-1 Height and Lateral Location of Signs—Typical Installations 1098
Figure 6F-2 Methods of Mounting Signs Other Than on Posts 1099
Figure 6F-3 Regulatory Signs and Plaques in Temporary Traffic Control Zones 1100
Figure 6F-4 Warning Signs and Plaques in Temporary Traffic Control Zones 1102
Figure 6F-5 Exit Open and Closed and Detour Signs 1105
Figure 6F-6 Advance Warning Arrow Board Display Specifications 1106
Figure 6F-7 Channelizing Devices 1107
Figure 6F-101(CA) California Temporary Traffic Control Signs 1108
Figure 6F-102(CA) Channelizer (CA) and Portable Delineator 1110
Figure 6F-103(CA) Examples of Object Markers in Temporary Traffic Control Zones 1111
Figure 6F-104(CA) Typical Layout Using Channelizing Devices to Delineate a Portable Changeable Message Sign on Shoulder 1112
Figure 6H-1 Work Beyond the Shoulder (TA-1) 1139
Figure 6H-2 Blasting Zone (TA-2) 1141
Figure 6H-3 Work on the Shoulders (TA-3) 1143
Figure 6H-4 Short-Duration or Mobile Operation on a Shoulder (TA-4) 1145
Figure 6H-5 Shoulder Closure on a Freeway (TA-5) 1147
Figure 6H-5(CA) Shoulder Closure on a Freeway (TA-5) 1148
Figure 6H-6 Shoulder Work with Minor Encroachment (TA-6) 1150
Figure 6H-7 Road Closure with a Diversion (TA-7) 1152
Figure 6H-8 Road Closure with an Off-Site Detour (TA-8) 1154
Figure 6H-9 Overlapping Routes with a Detour (TA-9) 1156
Figure 6H-10 Lane Closure on a Two-Lane Road Using Flaggers (TA-10) 1158
List of Figures

November 7, 2014
List of Figures

Figure 7A-1  Example of School Route Plan Map
Figure 7B-1  School Area Signs
Figure 7B-1(CA)  School Area Signs

Figure 7B-2  Example of Signing for a Higher Fines School Zone without a School Crossing
Figure 7B-3  Example of Signing for a Higher Fines School Zone with a School Speed Limit
Figure 7B-4  Example of Signing for a School Crossing Outside of a School Zone
Figure 7B-5  Example of Signing for a School Zone with a School Speed Limit and a School Crossing
Figure 7B-5(CA)  Example of Signing for a School Zone with a School Speed Limit and a School Crossing

Figure 7B-6  In-Street Signs in School Areas
Figure 7B-101(CA)  Example of School Area Signs with Flashing Yellow Beacons
Figure 7B-102(CA)  Example of Signing for Traffic Control in School Areas with Flashing Yellow Beacons
Figure 7B-103(CA)  Example of Signing for School Area Traffic Control with Extended and/or Reduced School Zone Speed Limits

Figure 7B-104(CA)  Example of Signing for School Crosswalk Warning Assembly
Figure 7C-1  Two Lane Pavement Marking of “SCHOOL”
Figure 7C-101(CA)  Pavement Word Markings for School Areas

Figure 8B-1  Regulatory Signs and Plaques for Grade Crossings
Figure 8B-1(CA)  Regulatory Signs and Plaques for Grade Crossings
Figure 8B-2  Crossbuck Assembly with a YIELD or STOP Sign on the Crossbuck Sign Support
Figure 8B-3  Crossbuck Assembly with a YIELD or STOP Sign on a Separate Sign Support
Figure 8B-4  Warning Signs and Plaques for Grade Crossings
Figure 8B-4(CA)  Warning Signs and Plaques for Grade Crossings

Figure 8B-5  Example of an Emergency Notification Sign
Figure 8B-5(CA)  Example of an Emergency Notification Sign
Figure 8B-6  Example of Placement of Warning Signs and Pavement Markings at Grade Crossings

Figure 8B-6(CA)  Example of Placement of Warning Signs and Pavement Markings at Grade Crossings
Figure 8B-7  Grade Crossing Pavement Markings
Figure 8B-7(CA)  Grade Crossing Pavement Markings
Figure 8B-8  Example of Dynamic Envelope Pavement Markings at Grade Crossings
Figure 8B-9  Examples of Light Rail Transit Vehicle Dynamic Envelope Markings for Mixed-Use Alignments

Figure 8B-101(CA)  Train Station Signs
Figure 8C-1  Composite Drawing of Active Traffic Control Devices for Grade Crossings Showing Clearances
Figure 8C-2  Example of Location Plan for Flashing-Light Signals and Four-Quadrant Gates
Figure 8C-3  Light Rail Transit Signals
Figure 8C-3(CA)  Light Rail Transit Signals

Figure 8C-4  Example of Flashing-Light Signal Assembly for Pedestrian Crossings
Figure 8C-5  Example of a Shared Pedestrian/Roadway Gate
Figure 8C-6  Example of a Separate Pedestrian Gate
Figure 8C-7  Examples of Placement of Pedestrian Gates
Figure 8C-8  Example of Swing Gates
Figure 8C-9  Example of Pedestrian Barriers at an Offset Grade Crossing
Figure 8C-10  Examples of Pedestrian Barrier Installation at an Offset Non-Intersection Grade Crossing

Figure 8D-1  Example of Signing and Markings for a Pathway Grade Crossing
Figure 9B-1  Sign Placement on Shared-Use Paths
Figure 9B-2  Regulatory Signs and Plaques for Bicycle Facilities
Figure 9B-2(CA)  California Regulatory Signs for Bicycle Facilities

Figure 9B-3  Warning Signs and Plaques for Bicycle Facilities
Figure 9B-4  Guide Signs and Plaques for Bicycle Facilities
Figure 9B-4(CA)  California Guide Signs for Bicycle Facilities

List of Figures  November 7, 2014
List of Figures

Figure 9B-5  Example of Signing for the Beginning and End of a Designated Bicycle Route on a Shared-Use Path 1371
Figure 9B-6  Example of Bicycle Guide Signing 1372
Figure 9B-7  Examples of Signing and Markings for a Shared-Use Path Crossing 1373
Figure 9B-8  Example of Mode-Specific Guide Signing on a Shared-Use Path 1374
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 1387
Figure 9C-2  Examples of Center Line Markings for Shared-Use Paths 1388
Figure 9C-3  Word, Symbol, and Arrow Pavement Markings for Bicycle Lanes 1389
Figure 9C-4  Example of Bicycle Lane Treatment at a Right Turn Only Lane 1390
Figure 9C-4(CA)  Example of Bicycle Lane Treatment at a Right Turn Only Lane 1391
Figure 9C-5  Example of Bicycle Lane Treatment at Parking Lane into a Right Turn Only Lane 1394
Figure 9C-6  Example of Pavement Markings for Bicycle Lanes on a Two-Way Street 1395
Figure 9C-7  Bicycle Detector Pavement Marking 1396
Figure 9C-8  Examples of Obstruction Pavement Markings 1397
Figure 9C-9  Shared Lane Marking 1397
Figure 9C-101(CA)  Marking Details for Bicycle Lanes 1398
Figure 9C-102(CA)  Examples of Bicycle Lane Treatment Where Vehicle Parking is Prohibited/Permitted 1399
Figure 9C-103(CA)  Example of Bicycle Lane Treatment Through an Interchange 1400
Figure 9C-104(CA)  Examples of Markings for Buffered Bicycle Lanes Where Vehicle Parking is Prohibited/Permitted 1401
Figure 9C-105(CA)  Example of Contraflow Bicycle Lanes 1403
Figure 9C-106(CA)  Example of Bicycle Lane Extensions Through an Intersection 1404
Figure 9C-107(CA)  Example of Marking for a One-Lane Roundabout with Shared Lane Markings and Bicycle Lanes 1405
Figure 9C-108(CA)  Example of Placement of Shared Lane Markings 1406
Figure 9C-109(CA)  Example of Shared Lane Markings While Approaching an Intersection 1407
Figure 9C-110(CA)  Example of Markings for Separated Bikeways 1408
Figure 9C-111(CA)  Example of Intersection Pavement Markings and Signs—Bicycle Travelling Straight From Left Turn and Right Turn Only Lanes—One Way 1410
Figure 9C-112(CA)  Example of Intersection Pavement Markings and Signs—Bicycle Travelling Straight From Left Turn and Right Turn Only Lanes 1411

Revised March 27, 2020
# LIST OF TABLES

| Table I-1 | Evolution of the MUTCD | 49 |
| Table I-1(CA) | Evolution of the California MUTCD | 49 |
| Table I-2 | Target Compliance Dates Established by the FHWA | 50 |
| Table I-2(CA) | Target Compliance Dates Established by CTCDC/Caltrans | 51 |
| Table 1A-101(CA) | Status of Interim Approvals Issued By FHWA in California | 64 |
| Table 1A-1 | Acceptable Abbreviations | 96 |
| Table 1A-2 | Abbreviations that Shall be Used Only on Portable Changeable Message Signs | 97 |
| Table 1A-3 | Unacceptable Abbreviations | 98 |
| Table 2A-1 | Illumination of Sign Elements | 120 |
| Table 2A-2 | Retroreflection of Sign Elements | 120 |
| Table 2A-3 | Minimum Maintained Retroreflectivity Levels | 121 |
| Table 2A-4 | Use of Sign Shapes | 122 |
| Table 2A-5 | Common Uses of Sign Colors | 123 |
| Table 2A-5(CA) | Common Uses of Sign Colors | 124 |
| Table 2B-1 | Regulatory Sign and Plaque Sizes | 244 |
| Table 2B-1(CA) | California Regulatory Sign and Plaque Sizes | 248 |
| Table 2B-2 | Meanings of Symbols and Legends on Reversible Lane Control Signs | 254 |
| Table 2B-101(CA) | Standard Application of Speed Limits per California Vehicle Code | 254 |
| Table 2B-102(CA) | Optional Application of Speed Limits per California Vehicle Code | 255 |
| Table 2C-1 | Categories of Warning Signs and Plaques | 306 |
| Table 2C-2 | Warning Sign and Plaque Sizes | 307 |
| Table 2C-2(CA) | California Warning Sign and Plaque Sizes | 310 |
| Table 2C-3 | Minimum Size of Supplemental Warning Plaques | 311 |
| Table 2C-4 | Guidelines for Advance Placement of Warning Signs | 312 |
| Table 2C-5 | Horizontal Alignment Sign Selection | 312 |
| Table 2C-6 | Approximate Spacing of Chevron Alignment Signs on Horizontal Curves | 313 |
| Table 2C-101(CA) | California Object Markers | 313 |
| Table 2D-1 | Conventional Road Guide Sign Sizes | 381 |
| Table 2D-1(CA) | California Conventional Road Guide Sign Sizes | 382 |
| Table 2D-2 | Recommended Minimum Letter Heights on Street Name Signs | 383 |
| Table 2D-101(CA) | Route Shield Sizes for Guide Signs | 384 |
| Table 2D-102(CA) | Criteria for Supplemental Destination Signs | 385 |
| Table 2E-1 | Freeway or Expressway Guide Sign and Plaque Sizes | 458 |
| Table 2E-1(CA) | California Freeway or Expressway Guide Sign and Plaque Sizes | 460 |
| Table 2E-2 | Minimum Letter and Numeral Sizes for Expressway Guide Signs According to Interchange Classification | 461 |
| Table 2E-3 | Minimum Letter and Numeral Sizes for Expressway Guide Signs According to Sign Type | 462 |
| Table 2E-4 | Minimum Letter and Numeral Sizes for Freeway Guide Signs According to Interchange Classification | 463 |
| Table 2E-5 | Minimum Letter and Numeral Sizes for Freeway Guide Signs According to Sign Type | 464 |
| Table 2F-1 | Toll Facility Sign and Plaque Minimum Sizes | 482 |
| Table 2G-1 | Managed and Preferential Lanes Sign and Plaque Minimum Sizes | 531 |
| Table 2G-1(CA) | California Managed and Preferential Lanes Sign and Plaque Minimum Sizes | 532 |
| Table 2H-1 | General Information Sign Sizes | 548 |
| Table 2H-1(CA) | California General Information Sign Sizes | 549 |
| Table 2I-1 | General Service Sign and Plaque Sizes | 580 |
| Table 2I-1(CA) | California General Service Sign and Plaque Sizes | 581 |
| Table 2J-1 | Minimum Letter and Numeral Sizes for Specific Service Signs According to Sign Type | 582 |
Type 599
Table 2J-101(CA) California Specific Service Sign and Plaque Sizes 599
Table 2K-101(CA) California Tourist-Oriented Directional Sign Sizes 607
Table 2L-1 Example of Units of Information 614
Table 2M-1 Category Chart for Recreational and Cultural Interest Area Symbols 641
Table 2M-1(CA) California Category Chart for Recreational and Cultural Interest Area Symbols 642
Table 2M-101(CA) California Recreational and Cultural Interest Area Sign and Plaque Sizes 643
Table 2N-1 Emergency Management Sign Sizes 648
Table 3B-1 Minimum Passing Sight Distances for No-Passing Zone Markings 767
Table 3D-1 Standard Edge Line and Lane Line Markings for Preferential Lanes 794
Table 3F-1 Approximate Spacing for Delineators on Horizontal Curves 808
Table 4C-1 Warrant 1, Eight-Hour Vehicular Volume 848
Table 4C-2 Warrant 9, Adjustment Factor for Daily Frequency of Rail Traffic 849
Table 4C-3 Warrant 9, Adjustment Factor for Percentage of High-Occupancy Buses 849
Table 4C-4 Warrant 9, Adjustment Factor for Percentage of Tractor-Trailer Trucks 849
Table 4D-1 Recommended Minimum Number of Primary Signal Faces for Through Traffic on Approaches with Posted, Statutory, or 85th-Percentile Speed of 45 mph or Higher 930
Table 4D-2 Minimum Sight Distance for Signal Visibility 930
Table 4D-101(CA) Suggested Detector Setbacks from Limit Line 931
Table 4D-102(CA) Minimum Yellow Change Interval 932
Table 4D-103(CA) Traffic Signal Timing Analysis Chart 933
Table 4D-104(CA) Signal Operations – Vehicular Speed 934
Table 4D-105(CA) Pole and Equipment Schedule 935
Table 4D-106(CA) Conductor and Conduit Schedule 936
Table 4D-107(CA) Available Conduit Area 937
Table 4D-108(CA) Conductor Size 938
Table 4D-109(CA) Signal Operations – Minimum Bicycle Timing 939
Table 5A-1 Sign and Plaque Sizes on Low-Volume Roads 995
Table 6C-1 Recommended Advance Warning Sign Minimum Spacing 1032
Table 6C-2 Stopping Sight Distance as a Function of Speed 1032
Table 6C-3 Taper Length Criteria for Temporary Traffic Control Zones 1032
Table 6C-3(CA) Taper Length Criteria for Temporary Traffic Control Zones (for 12 feet Offset Width) 1033
Table 6C-4 Formulas for Determining Taper Length 1033
Table 6C-101(CA) Stopping Sight Distance as a Function of Speed on Downgrades 1034
Table 6E-1 Stopping Sight Distance as a Function of Speed 1052
Table 6E-101(CA) Longitudinal Buffer Space or Flagger Station Spacing on Downgrades 1052
Table 6F-1 Temporary Traffic Control Zone Sign and Plaque Sizes 1113
Table 6F-1(CA) California Temporary Traffic Control Zone Sign and Plaque Sizes 1116
Table 6F-101(CA) Maximum Spacing of Channelizing Devices 1117
Table 6F-102(CA) Pavement Surface Tolerances 1118
Table 6H-1 Index to Typical Applications 1134
Table 6H-1(CA) Index to Typical Applications 1135
Table 6H-2 Meaning of Symbols on Typical Application Diagrams 1135
Table 6H-3 Meaning of Letter Codes on Typical Application Diagrams 1136
Table 6H-4 Formulas for Determining Taper Length 1136
Table 6H-4(CA) Taper Length Criteria for Temporary Traffic Control Zones (for 12 feet Offset Width) 1137
Table 7B-1 School Area Sign and Plaque Sizes 1282
Table 7B-1(CA) California School Area Sign Assembly Sizes 1282
Table 8B-1 Grade Crossing Sign and Plaque Minimum Sizes 1324
Table 8B-1(CA) California Grade Crossing Sign and Plaque Minimum Sizes 1325
Table 9B-1 Bicycle Facility Sign and Plaque Minimum Sizes 1375
Table 9B-1(CA) California Bicycle Facility Sign and Plaque Minimum Sizes 1377
Table A2-1 Conversion of Inches to Millimeters 1419
<table>
<thead>
<tr>
<th>Table A2-2</th>
<th>Conversion of Feet to Meters</th>
<th>1419</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table A2-3</td>
<td>Conversion of Miles to Kilometers</td>
<td>1419</td>
</tr>
<tr>
<td>Table A2-4</td>
<td>Conversion of Miles per Hour to Kilometers/Hour</td>
<td>1419</td>
</tr>
</tbody>
</table>
CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 2014

FOREWORD

The California Department of Transportation (Caltrans) is pleased to announce the 2014 update of the California Manual on Uniform Traffic Control Devices (CA MUTCD). This update coincides with implementation of Caltrans’ 2014 mission to provide a safe, sustainable, integrated, and efficient transportation system to enhance California’s economy and livability. This update to the CA MUTCD aims to improve safety and mobility for all travelers in California by providing guidance to transportation practitioners that strives to balance safety and convenience for everyone in traffic—drivers, pedestrians, and bicyclists.

Significantly, the CA MUTCD integrates multimodal policies for safer crossings, work zones, and intersections, with improvements including:

- Crosswalks Enhancements Policy (TOPD 12–03, CA MUTCD 2014 Section 3B.18)
- Temporary Traffic Control Plans (CA MUTCD 2014 Section 6C.01)
- Work Zone and Higher Fines Signs and Plaques (CA MUTCD 2014 Section 6F.12)
- Traffic Control for School Areas (CA MUTCD 2014 Part 7)

As part of this update, Section 1A.10 of the CA MUTCD now includes Table 1A-101(CA), “Status of Interim Approvals Issued By FHWA in California,” which lists adopted statewide policies or approvals authorized by the Federal Highway Administration (FHWA) for use on all California streets and highways (without the Section 1A.10 experimentation approval requirement). Caltrans regularly updates the CA MUTCD with guidance from the California Traffic Control Devices Committee (CTCDC). We encourage all practitioners to not only use this manual but also to visit the CTCDC Web site at http://www.dot.ca.gov/traffops/engineering/ctcdc/ for the most recent updates and actions by the CTCDC.

In addition, on April 11, 2014, Caltrans endorsed the National Association of City Transportation Officials (NACTO) Urban Street Design Guide as a valuable resource when making planning and design decisions about the State Highway System and local streets and roads. The NACTO Urban Street Design Guide includes many concepts contained in Main Street, California: A Guide for Improving Community Transportation Vitality. Similarly, much of the NACTO Urban Bikeway Design Guide is consistent with the guidance provided in the CA MUTCD for related topics. We continue to analyze NACTO guidance and will work with all stakeholders to ensure flexibility and innovation in the design and operation of California streets and highways.

As Caltrans continues to implement its new mission, transportation practitioners should rely on the CA MUTCD for mandatory standards, guidance, and options for twenty-first–century operation of California’s multimodal transportation system.

MALCOLM DOUGHERTY
Director
California Department of Transportation

Foreword
November 7, 2014
CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES

INTRODUCTION

Support:

00a This California Manual on Uniform Traffic Control Devices (California MUTCD) is published by the State of California, Caltrans and is issued to adopt uniform standards and specifications for all official traffic control devices in California, in accordance with Section 21400 of the California Vehicle Code (CVC).

00b This California MUTCD incorporates Federal Highway Administration's Manual on Uniform Traffic Control Devices (2009 Edition) dated December 16, 2009 and the previous California MUTCD dated January 13, 2012. It also incorporates all policies on traffic control devices issued by Caltrans that have been issued since January 13, 2012 and other editorial, errata and format changes that were necessary to update the previous documents.

Standard:

00c The California MUTCD is hereby adopted as, and shall be the standard for all official traffic control devices, under Section 11340.9(h) of California Government Code and Section 21400 of California Vehicle Code.

Support:


00e Caltrans publishes Standard Specifications, Standard Special Provisions, Standard Plans and other manuals, which contain specifications and requirements for traffic control devices, including their use and placement, when performing work on State highways. In some cases those specifications and requirements can vary from, and be more stringent than those shown in the California MUTCD.

Standard:

00f On State highways, the California MUTCD shall mean to include Caltrans' Standard Plans, Standard Specifications and Standard Special Provisions publications.

00g On State highways, the California MUTCD shall not supersede Caltrans' Standard Plans, Standard Specifications or the Special Provisions publications but all Standard statements of the California MUTCD shall be met. On State highways, whenever there is a discrepancy between the specifications and requirements contained in the California MUTCD, and those contained in the Caltrans' Standard Plans, Standard Specifications or the Special Provisions publications, the Caltrans' Standard Plans, Standard Specifications or the Special Provisions publications shall govern.

00h Nothing contained in the California MUTCD shall prevent Caltrans from modifying, changing or adopting new specifications as necessary. Any revisions to the Caltrans' Standard Plans, Standard Specifications or the Special Provisions shall conform to the Standard statements of the California MUTCD.

00i Whenever there is a discrepancy between the specifications and requirements incorporated from FHWA's MUTCD and the California MUTCD amendments, the California MUTCD amendments shall govern.

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 MUTCD national standard and Caltrans standards and specifications for traffic control devices shall not be applicable to privately owned and maintained roads or commercial establishments, unless the particular city or county enacts an ordinance or resolution to this effect. Refer to CVC Sections 21100, 21100.1, 21107, 21107.5,
21107.6, and 21107.7. 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.

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; Privately owned and maintained roads or commercial establishments, if the particular city or county enacts an ordinance or resolution to this effect. Refer to CVC Sections 21100, 21100.1, 21107, 21107.5, 21107.6, and 21107.7.
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. All publicly owned parking areas and only those privately owned parking areas where the particular city or county has enacted a resolution to this effect, including the driving aisles within those parking areas shall be subject to MUTCD applicability.

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. The Caltrans logos consisting of the “CT” symbol and the “Caltrans” logotype are registered service marks and when used on any traffic control device they shall be presented in a uniform and consistent manner as outlined in Caltrans’ Deputy Directive DD-33-R1.

Support:

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.

This Manual is not applicable to privately owned and maintained roads or commercial establishments in California, unless the particular city or county enacts an ordinance or resolution to this effect. Refer to CVC Sections 21100, 21100.1, 21107, 21107.5, 21107.6, and 21107.7. However, the use of this Manual is encouraged on all privately owned and maintained roads or commercial establishments, in general, as a good practice. See Section 1A.07 for more information.

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.

The Division of Highways in California Department of Public Works, now known as Department of Transportation (Caltrans), published a Planning Manual of Instructions in 1952. Part 8, called Traffic was subsequently added to the Planning Manual in 1955. In 1972, the first separate publication called the Traffic Manual was published. Efforts were undertaken in 2000 by Caltrans along with California Traffic Control Devices Committee (CTCDC) to reconcile the Traffic Manual with the National Manual on Uniform Traffic Control Devices (MUTCD). These efforts culminated in the adoption of the National MUTCD with a California Supplement in 2004. In 2006, the California Supplement and the National MUTCD were combined into a single document, called the California MUTCD. Table I-1(CA) traces the evolution of the California MUTCD.
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 public streets and highways open to public travel (and privately owned and maintained roads or commercial establishments, if the particular city or county enacts an ordinance or resolution to this effect), 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.”

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.

11a The figures shown in the California MUTCD are typical or example applications of the traffic control devices to illustrate their use and manner. Criteria for position, location, and use of traffic control devices in the figures are furnished solely for the purpose of guidance, understanding and information, and are not a legal standard. Engineering judgment must be used to apply these guidelines to the typical or example applications, or adjust them to fit individual field site conditions. The California MUTCD is not intended to be a substitute for engineering knowledge, experience or judgment.

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. For all purposes, regardless of the text heading, any sentence containing the verb shall or MUTCD text edited to the verb shall, shall be considered a Standard. Similarly, any sentence containing the verb should or MUTCD text edited to the verb should, shall be considered Guidance and any sentence containing the verb may or MUTCD text edited to the verb may, shall be considered an Option.

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.

14a In 1993, Caltrans had adopted the International System of Units as the preferred system of weights and measures to comply with federal law. The law was subsequently changed making the use of the Metric System optional. Caltrans made the decision in 2004 to readopt the U.S. Customary (English) system of units and measures as the preferred system. Guidance on the use of the Metric and U.S. Customary Systems of Measurement is available from Caltrans’ Division of Design.

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

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.

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.”

The California MUTCD uses a format similar to the National MUTCD. It incorporates National MUTCD in its entirety and explicitly shows which portions thereof are applicable or not applicable in California. The unedited National MUTCD text is shown in “Times New Roman” font with black color. Text portions of the National MUTCD content that are not applicable in California are shown with a strikethrough and a blue margin line on the right. The California text additions, including new paragraphs, and enhancements are incorporated into the combined document at appropriate locations and shown in an “Arial Narrow” font with blue color and a blue margin line on the right to keep them distinct from the National MUTCD content. Changes or additions to text, figures and tables in Revision 1 of the California MUTCD, effective December 9, 2015, are shown with an orange-color margin line on the left. Changes or additions to text, figures and tables in Revision 2 of the California MUTCD, effective April 7, 2017, are shown with a green-color margin line on the left. Changes or additions to text, figures and tables in Revision 3 of the California MUTCD, effective March 9, 2018, are shown with a purple-color margin line on the left. Changes or additions to text, figures and tables in Revision 4 of the California MUTCD, effective March 29, 2019, are shown with a gray-color margin line on the left. Changes or additions to text, figures and tables in Revision 5 of the California MUTCD, effective March 27, 2020, are shown with a light blue-color margin line on the left.

All MUTCD figures and tables, or portions thereof, which are not applicable in California, are shown with appropriate size blue X cross-outs. The MUTCD figures and tables that have been modified or added to, in the California MUTCD retain the same MUTCD Figure or Table number but include “(CA)” to indicate that it is the California version of the MUTCD Figure or Table. For example:

A. Figure 3B-18(CA) Do Not Block Intersection Markings
B. Table 2H-1(CA) California General Information Sign Sizes

For California topics where there is no corresponding section, figure or table in the MUTCD, the California MUTCD gives a number that begins with the number 101 for that section, figure or table and increases in sequence, followed with a “(CA)” to indicate that this is a California created section, figure or table number. For example:

A. Section 4D.105(CA) – Bicycle/Motorcycle Detection
B. Figure 6H-103(CA) – Detour for Bike Lane on Roads with Closure of One Travel Direction
C. Table 4D-102(CA) – Minimum Yellow Change Interval Timing

The California MUTCD contents within each chapter (Chapter 2B shown as example below) appear in a consistent order for ease of reference. This sequence is as follows:

A. MUTCD Sections per sequential numbering. For example, Sections 2B.01 through 2B.68.
B. California Sections per sequential numbering. For example, Sections 2B.101(CA) through 2B.111(CA).
C. MUTCD Figures (including edited and deleted) per sequential numbering. For example, Figures 2B-1 through 2B-32.
D. California Figures based upon or modifying MUTCD Figures are placed immediately after the respective MUTCD figure. For example, Figure 2B-12(CA) follows immediately after the deleted MUTCD Figure 2B-12 it replaces. Another example is Figure 2B-10(CA) which immediately follows MUTCD (undeleted) Figure 2B-10 as the California figure supplements the MUTCD Figure, it does not replace it.
E. California Figures that are stand alone and not based upon MUTCD Figures follow in sequence per their numbering. For example, Figures 2B-101(CA) through 2B-106(CA) follow after the end of MUTCD numbered figures.

F. MUTCD and California Tables follow the Figures under similar rules described above for the figures.

**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 highway 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.

**Standard:**

25 Unless allowed per the Option below, in cases involving new highway or bikeway construction or reconstruction, the traffic control devices installed (temporary or permanent) shall be in conformance with the current edition of the California MUTCD before that highway is opened or re-opened to the public for unrestricted travel pursuant to the California Vehicle Code 21401.

**Option:**

26 In cases involving new highway or bikeway construction or reconstruction, the traffic control devices installed (temporary or permanent) may be in accordance with previous traffic control device standards of January 13, 2012, January 21, 2010 or September 26, 2006 California MUTCD or prior to that of MUTCD 2003 and MUTCD 2003 California Supplement or Caltrans Traffic Manual, if in the judgment of the engineer, incorporating the California MUTCD standards would impose a significant delay or a significant increase in costs for the project.

**Support:**

27 Reconstruction, as used in the previous Standard and Option topics, for the purpose of a traffic control device would mean if a particular device is modified in any form or shape or is relocated. If a reconstruction project does not modify or relocate a traffic control device, although encouraged, there would be no obligation to upgrade the traffic control device per current edition of the California MUTCD standards.

**Standard:**

28 Unless allowed per the option below, non-compliant traffic control devices on existing highways and bikeways shall be brought into compliance with the California MUTCD as part of the systematic upgrading of
substandard traffic control devices (and installation of new required traffic control devices) required pursuant to the California Vehicle Code 21401.

Option:

29 All traffic control devices on existing highways and bikeways that have become non-compliant per California MUTCD adopted standards may remain in service through the end of their useful service life.

30 To limit financial impact on agencies and for fiscal responsibility reasons, existing inventory of non-compliant traffic control devices may continue to be used until these inventories are depleted.
### Table I-1(CA) Evolution of the California MUTCD

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Month / Year Revised</th>
</tr>
</thead>
<tbody>
<tr>
<td>1955</td>
<td>Planning Manual of Instructions, Part 8 – Traffic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Public Works, Division of Highways</td>
<td></td>
</tr>
<tr>
<td>1972</td>
<td>Traffic Manual</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Public Works, Division of Highways</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>Traffic Manual (Metric Version)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>FHWA’s MUTCD 2003 &amp; MUTCD 2003 California Supplement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>California MUTCD</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>California MUTCD (including Revisions. 1 and 2 of FHWA’s MUTCD 2003)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>California MUTCD (including FHWA’s MUTCD 2009)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>California MUTCD (including FHWA’s MUTCD 2009 Revisions 1 &amp; 2, as amended for use in California)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>California MUTCD, Revision 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>California MUTCD, Revision 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>California MUTCD, Revision 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>California MUTCD, Revision 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>California MUTCD, Revision 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Department of Transportation, Division of Traffic Operations</td>
<td></td>
</tr>
</tbody>
</table>
### Table I-2. Target Compliance Dates Established by the FHWA

<table>
<thead>
<tr>
<th>2009 MUTCD Section Number(s)</th>
<th>2009 MUTCD Section Title</th>
<th>Specific Provision</th>
<th>Compliance Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2A.08</td>
<td>Maintaining Minimum Retrorreflectivity</td>
<td>Implementation and continued use of an assessment or management method that is designed to maintain regulatory and warning sign retroreflectivity at or above the established minimum levels (see Paragraph 2)</td>
<td>June 13, 2014</td>
</tr>
<tr>
<td>2B.40</td>
<td>Insertion Offset</td>
<td>Qualification of signs supports on roads with posted speed limit of 60 mph or higher (see Paragraph 2)</td>
<td>January 12, 2015</td>
</tr>
<tr>
<td>2B.60 through 2C.14</td>
<td>Horizontal Alignment Warning Signs</td>
<td>Revised requirements in the 2009 MUTCD regarding the use of various horizontal alignment signs (see Table 2C-5)</td>
<td>December 31, 2019</td>
</tr>
<tr>
<td>2E.31, 2E.33, and 2E.36</td>
<td>Plaques for Left-Hand Exits</td>
<td>New requirement in the 2009 MUTCD to use E1-5aP and E1-5bP plaques for left-hand exits</td>
<td>December 31, 2014</td>
</tr>
<tr>
<td>4D.26</td>
<td>Yellow Change and Red Clearance Intervals</td>
<td>New requirement in the 2009 MUTCD that durations of yellow change and red clearance intervals shall be determined using engineering practices (see Paragraphs 3 and 6)</td>
<td>June 13, 2017</td>
</tr>
<tr>
<td>4E.06</td>
<td>Pedestrian Intervals and Signal Phases</td>
<td>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 (see Paragraph 4)</td>
<td>June 13, 2017</td>
</tr>
<tr>
<td>6D.03**</td>
<td>Worker Safety Considerations</td>
<td>New requirement in the 2009 MUTCD that all workers within the right-of-way shall wear high-visibility apparel (see Paragraphs 4, 6, and 7)</td>
<td>December 31, 2011</td>
</tr>
<tr>
<td>6E.02**</td>
<td>High-Visibility Safety Apparel</td>
<td>New requirement in the 2009 MUTCD that all flaggers within the right-of-way shall wear high-visibility apparel</td>
<td>December 31, 2011</td>
</tr>
<tr>
<td>7D.04**</td>
<td>Uniform of Adult Crossing Guards</td>
<td>New requirement in the 2009 MUTCD for high-visibility apparel for adult crossing guards</td>
<td>December 31, 2011</td>
</tr>
<tr>
<td>8B.03, 8B.04</td>
<td>Grade Crossing (Crossbuck) Signs and Supports</td>
<td>Retroreflective strip on Crossbuck sign and support (see Paragraph 7 in Section 8B.03 and Paragraphs 15 and 18 in Section 8B.04)</td>
<td>December 31, 2019</td>
</tr>
<tr>
<td>8B.04</td>
<td>Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings</td>
<td>New requirement in the 2009 MUTCD for the use of STOP or YIELD signs with Crossbuck signs at passive grade crossings</td>
<td>December 31, 2019</td>
</tr>
</tbody>
</table>

* Types of signs other than regulatory or warning are to be added to an agency’s management or assessment method as resources allow.
** MUTCD requirement is a result of a legislative mandate.

Note: All compliance dates that were previously published in Table I-2 of the 2009 MUTCD and that do not appear in this revised table have been eliminated.
### Table I-2(CA). Target Compliance Dates Established by the CTCDC/Caltrans

<table>
<thead>
<tr>
<th>2014 CA MUTCD Section Number(s)</th>
<th>2014 CA MUTCD Section Title</th>
<th>Specific Provision</th>
<th>Compliance Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>4D.26</td>
<td>Yellow Change &amp; Red Clearance Intervals</td>
<td>Signalized intersections equipped with Red Light Cameras shall comply with 2014 CA MUTCD, Section 4D.26</td>
<td>August 1, 2015</td>
</tr>
<tr>
<td>4D.26</td>
<td>Yellow Change &amp; Red Clearance Intervals</td>
<td>All signalized intersections shall comply with 2014 CA MUTCD, Section 4D.26</td>
<td>August 1, 2017</td>
</tr>
</tbody>
</table>