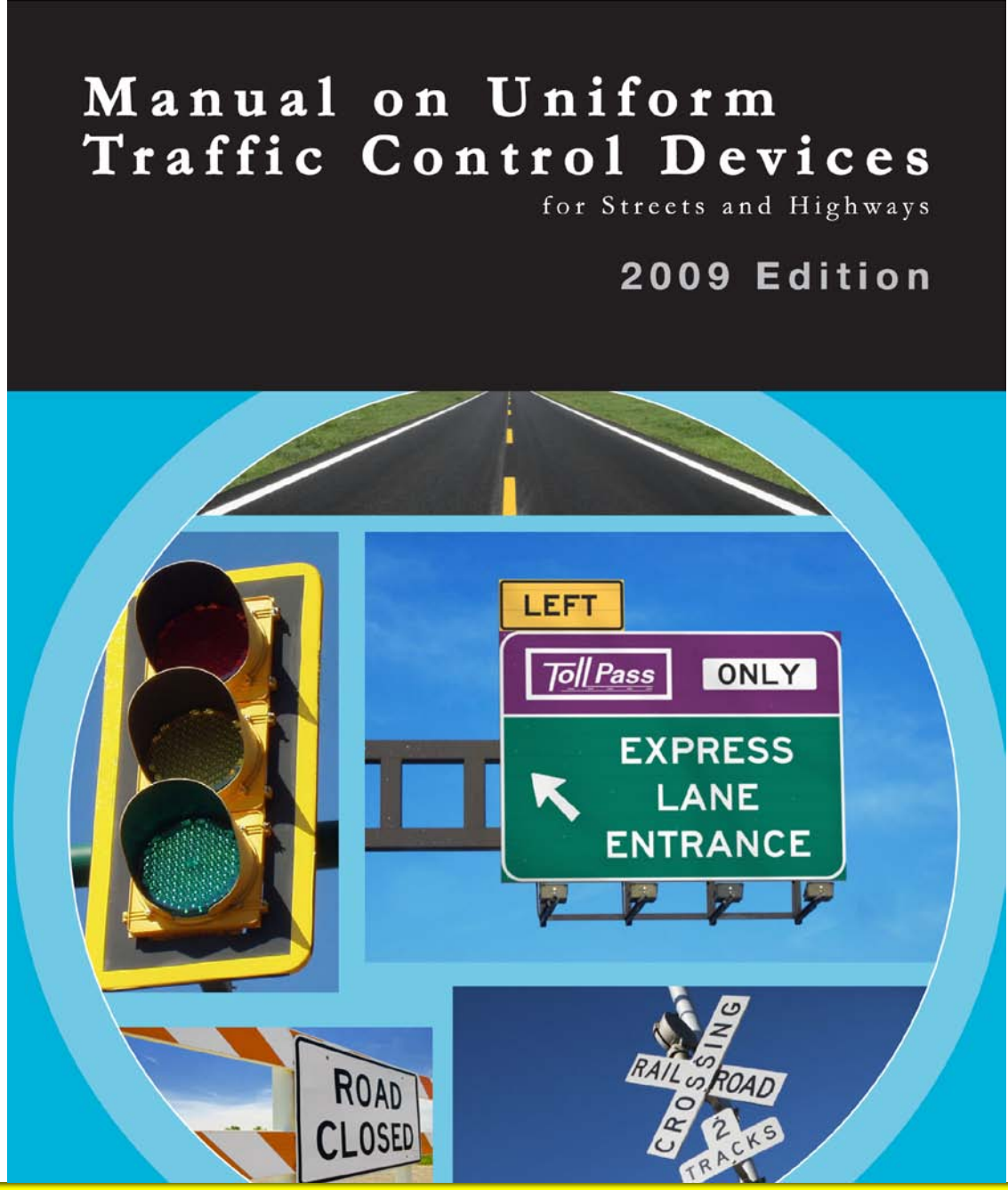
2009 Manual on Uniform Traffic Control Devices



Revisions Incorporated into the 2009 MUTCD

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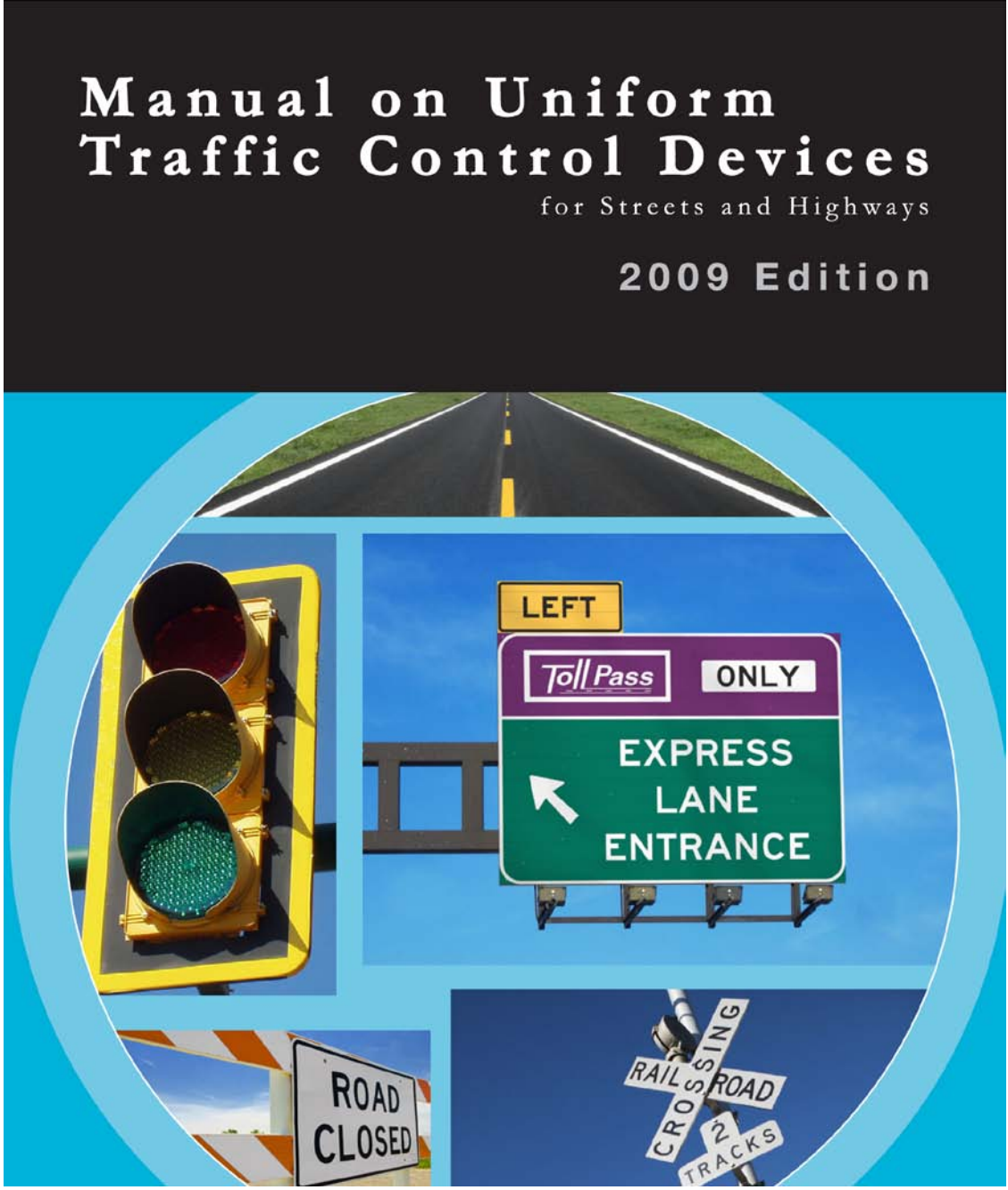
2009 Manual on Uniform Traffic Control Devices



Outline

- General Revisions
- Revisions to Part 6
- Questions

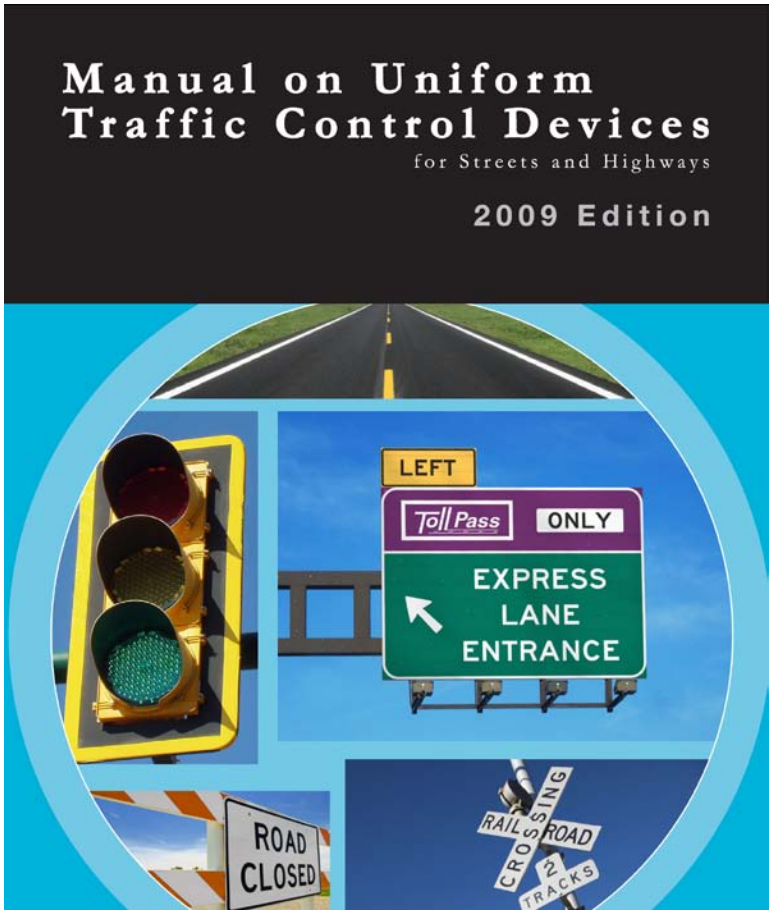
General Revisions

Development of the 2009 MUTCD

- NPA published in the Federal Register on January 2, 2008
- Received 1,840 individual letters with over 15,000 comments
- Final Rule published in the Federal Register on December 16, 2009 (effective date of January 15, 2010)

2009 MUTCD: Key Themes

- Uniformity
- Complete street concept: all road users
- Aging population
- Innovation



Revisions Incorporated into the 2009 MUTCD

Compliance dates

- New installations, replacements, and rebuilds must comply immediately
- New Table I-2 with specific compliance dates to retrofit or replace existing devices to meet 11 of the new Standards in the 2009 edition

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

2009 MUTCD Section Number(s)	2009 MUTCD Section Title	Specific Provision	Compliance Date
2C.50	Non-Vehicular Warning Signs	Elimination of crosswalk lines from crossing signs and use of diagonal downward pointing arrow (W16-7P) supplemental plaque if at the crossing (2003 MUTCD Section 2C.41)	January 17, 2011 (a)(b)
2C.61	PHOTO ENFORCED Plaque (W16-10P)	New plaque (2003 MUTCD Section 2C.53) (*)	December 22, 2013 (b)
2C.63	Object Marker Design and Placement Height	Width of stripes on Type 3 striped marker (2003 MUTCD Section 3C.01)	December 22, 2013 (b)
2D.43	Street Name Signs (D3-1 or D3-1a)	6-inch letter height for lettering on post-mounted Street Name signs (except on multi-lane streets with speed limits greater than 40 mph) (2000 MUTCD Section 2D.38)	January 9, 2012 (a)
2D.43	Street Name Signs (D3-1 or D3-1a)	8-inch letter height on post-mounted signs on multi-lane streets with speed limits greater than 40 mph and 12-inch letter height on overhead signs (2003 MUTCD Section 2D.38)	December 22, 2018 (b)
2D.44	Advance Street Name Signs (D3-2)	Requirements of new Section 2D.39 in the 2003 MUTCD	December 22, 2018 (b)
2D.45	Signing on Conventional Roads on Approaches to Interchanges	New requirement in the 2009 MUTCD for multi-lane approaches to interchanges to have guide signs to identify which direction of turn is to be made for access to each direction of the freeway or expressway	December 31, 2019

Previously-established dates

New compliance date in 2009 edition

MUTCD applies to private roads that are “open to public travel”

Toll roads and roads within shopping centers, airports, sports arenas, theme parks, and similar business or recreation facilities that are privately owned, but the public is allowed to travel without access restrictions

Parking areas and their driving aisles are not subject to MUTCD requirements

Metric values have been removed from the text, figures, and tables

- **Only English units are used in the text, figures, and tables of the 2009 MUTCD**

New Appendix A2 includes the equivalent metric values for all English units used in the 2009 MUTCD

2009 Edition

APPENDIX A2

METRIC CONVERSIONS

Throughout this Manual all dimensions and distances are provided in English units. Tables A2-1 th
A2-4 show the equivalent Metric (International System of Units) value for each of the English unit num
values that are used in this Manual.

Table A2-1. Conversion of Inches to Millimeters

Inches	Millimeters
0.25	6
0.4	10
0.5	13
0.75	19
1	25
1.25	31
2	50
2.25	56
2.5	62
3	75

Inches	Millimeters
3.5	87
4	100
4.5	113
5	125
6	150
8	200
9	225
10	250
10.4	260
10.6	265

Inches	Millimeters
12	300
15	375
16	400
18	450
21	525
24	600
27	675
28	700
30	750
32	800

Inches	M
36	
42	
48	
54	
60	
72	
84	
120	

Note: 1 inch = 25.4 millimeters; 1 millimeter = 0.039 inches

Paragraphs are numbered!

Guidance statements are *italicized*

Section 4B.01 General

Support:

01 Words such as pedestrians and bicyclis sensitivity to these elements of "traffic."

02 Standards for traffic control signals ar of a variety of road users, including those fatigued or distracted, or who are not expe

Section 4B.02 Basis of Installation or

Guidance:

01 *The selection and use of traffic contro and other conditions.*

Support:

02 A careful analysis of traffic operations of signalized and unsignalized locations, c warrants, described in Chapter 4C, that de signals might be justified.

Guidance:

03 *Engineering judgment should be appli*

Definitions

- All definitions now appear in Part 1 (Section 1A.13) and not in other Parts
- Approximately 70 new definitions have been added
- Approximately 35 existing definitions have been revised

Meanings of text headings (Standard, Guidance, Option, Support) relocated and clarified

- Relocated from MUTCD Introduction to Section 1A.13
- Standard statements shall not be modified or compromised based on engineering judgment or engineering study

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

Standard:

01 **When used in this Manual, the text headings of Standard, Guidance, Option, and Support shall be defined as follows:**

A. Standard—a statement of required, mandatory, or specifically prohibitive practice regarding a traffic control device. All Standard statements are labeled, and the text appears in bold type. The verb "shall" is typically used. The verbs "should" and "may" are not used in Standard statements. Standard statements are sometimes modified by Options. Standard statements shall not be modified or compromised based on engineering judgment or engineering study.

B. Guidance—a statement of recommended, but not mandatory, practice in typical situations, with deviations allowed if engineering judgment or engineering study indicates the deviation to be appropriate. All Guidance statements are labeled, and the text appears in unbold type. The verb

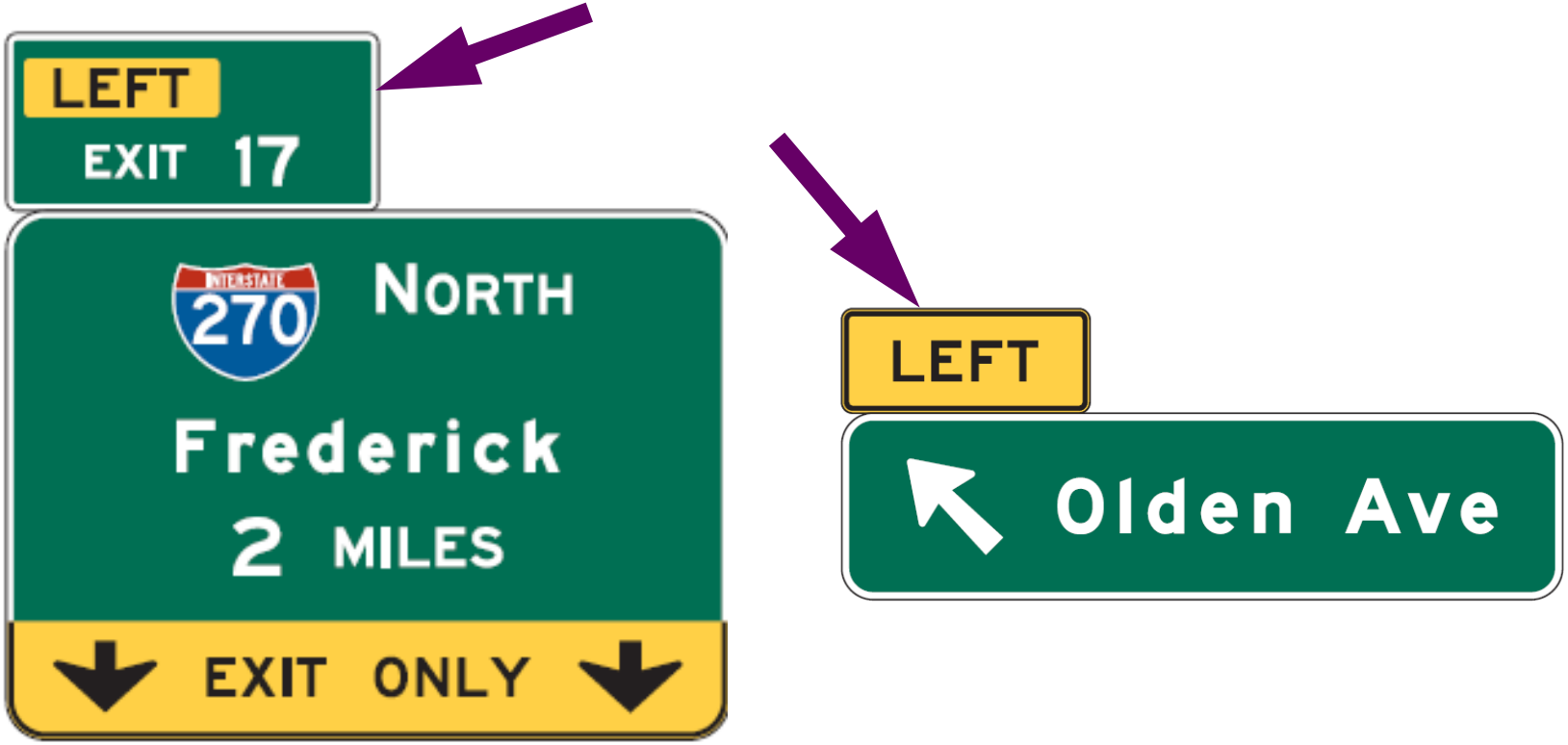
New chapters and revisions for Part 2

- Relocation of gates and barricades to Chapter 2B
- Relocation of object markers from Part 3 to Chapter 2C
- New Chapter 2F – Toll Road Signs
- New Chapter 2G – Preferential and Managed Lanes
- New Chapter 2H – General Information Signs
- New Chapter 2I – General Service Signs
- New Chapter 2L – Changeable Message Signs

Agencies can decide whether to illuminate overhead signs based on their own policies and studies

- Guidance recommending illumination of overhead signs was deleted, because the minimum maintained retroreflectivity levels for overhead signs (2003 MUTCD Revision 2 adopted December 2007) provide for adequate performance of these signs

New Overhead Arrow-per-Lane signs for “option-lane” exits and splits feature an up arrow over each lane

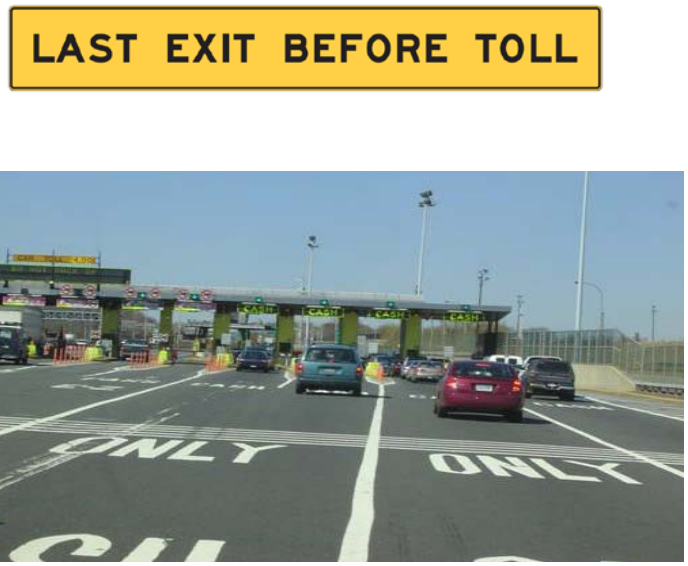


LEFT plaques are required for numbered and non-numbered exits to the left

Traffic control devices for toll plazas, managed lanes, and preferential lanes

Revisions Incorporated into the 2009 MUTCD

Figure 2F-9. Examples of Toll Plaza Canopy Signs



LAST EXIT BEFORE TOLL

CASH - CHANGE RECEIPTS

Attended Lane with an Optional M4-17 Toll Collector Symbol

EXACT CHANGE 75¢
OR Toll Pass
NO TRUCKS

Exact Change or ETC Account Lane with an Optional M4-18 Exact Change Symbol

Toll Pass
ONLY

ETC Account-Only Lane

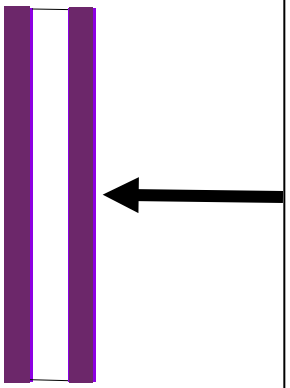
Toll Pass OR
HOV 2+ ONLY
EXPRESS LANE ENTRANCE

EXPRESS LANE
Toll Pass TOLL
TO 128 $ 0.50
TO 495 $ 2.00
HOV 2+ NO TOLL

INTERSTATE 495 VIA
EXPRESS LANE 32 MINS
LOCAL LANES 46 MINS

New Chapter 3E – Markings for toll plazas

Optional purple markings for ETC account-only lanes



Note: To be reverse pattern of that shown in the photo – white lane line with purple borders

12-inch indications required for all new traffic control signal faces

6 options for use of new 8-inch circular indications in special circumstances

(including ≤ 30 mph if < 120 feet from stop line)

Approaches with speeds ≥ 45 mph: recommended number, location, and design of signal faces

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

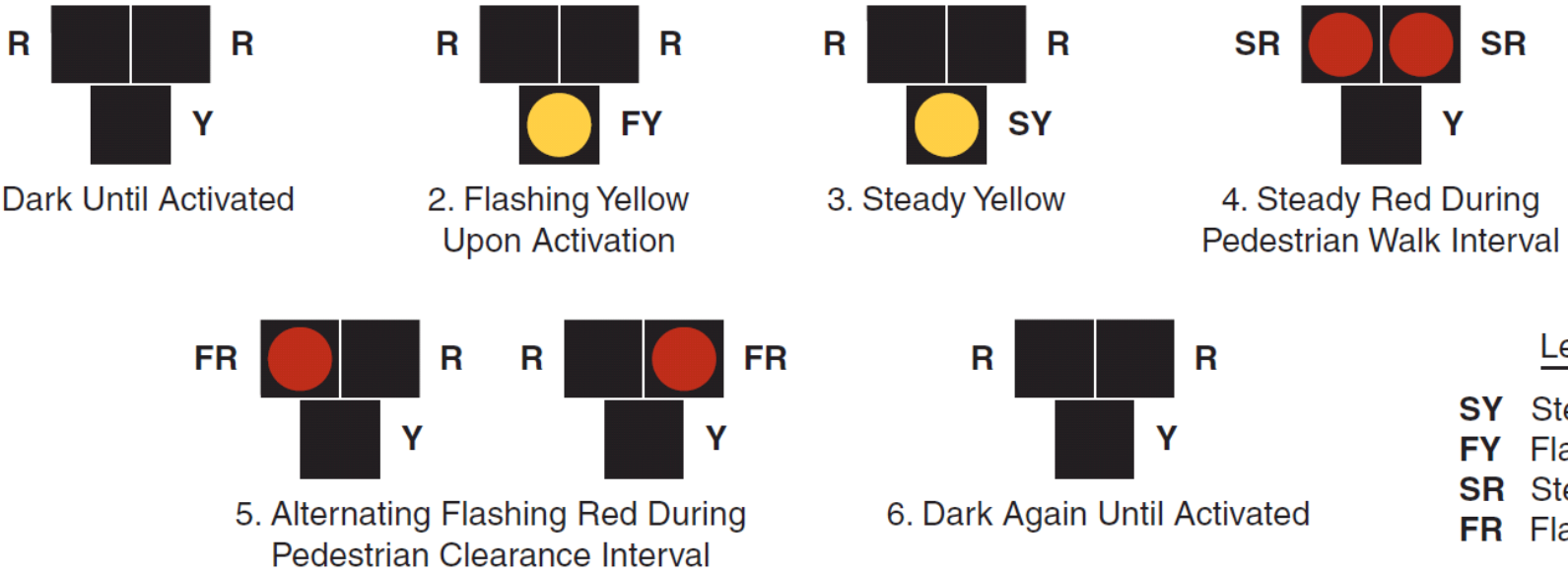
Number of Through Lanes on Approach	Total Number of Primary Through Signal Faces for Approach*	Minimum Number of Overhead-Mounted Primary Through Signal Faces for Approach
1	2	1
2	2	1
3	3	2**
4 or more	4 or more	3**

NOTES: * A minimum of two through signal faces is always required (See Section 4D.11). These recommended numbers of through signal faces may be exceeded. Also, see cone of vision requirements otherwise indicated in Section 4D.13.

** If practical, all of the recommended number of primary through signal faces should be located overhead.

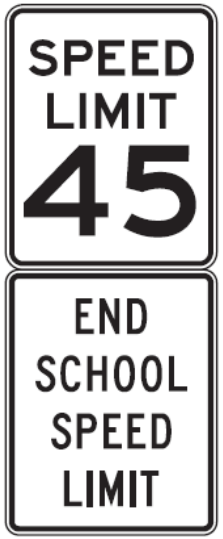
New Chapter 4F
New pedestrian hybrid beacon

Figure 4F-3. Sequence for a Pedestrian Hybrid Beacon



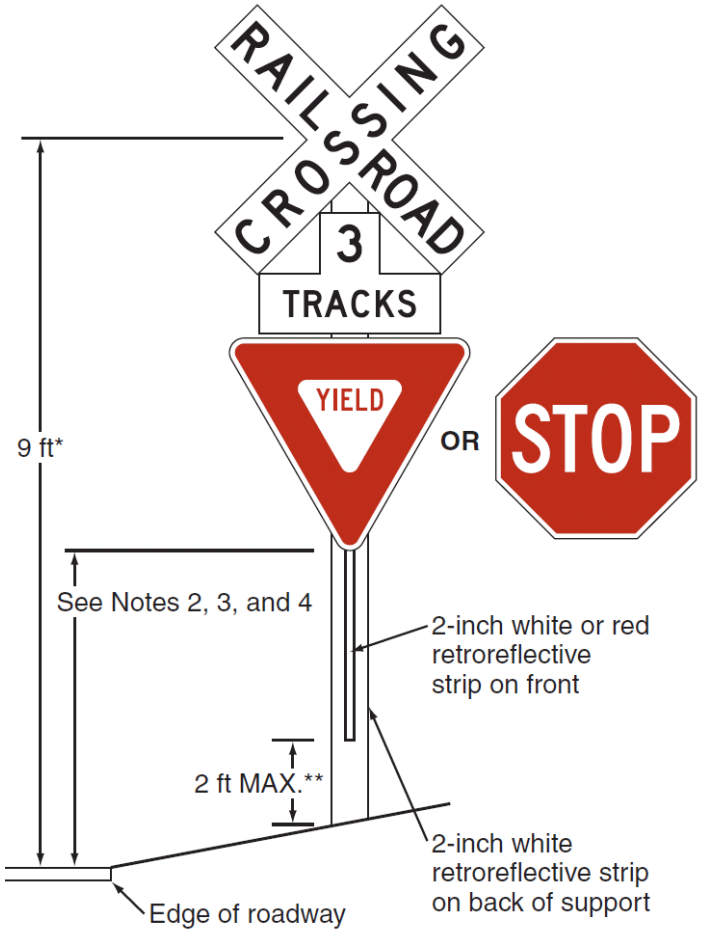
Part 7 Revisions

- Deletion of duplicated provisions
- FYG background color required
- New school bus symbol
- Clarification of terminology (school zone, school area, reduced speed limit zone, etc.)
- Cannot use Speed Limit sign alone to end reduced school speed limit zone
- Student safety patrols



Parts 8 and 10 were combined into a single Part 8 for highway-rail and highway-LRT grade crossings

YIELD or STOP signs required at passive highway-rail grade crossings (December 31, 2019 compliance date)



Revisions to Part 6 – Temporary Traffic Control

Chapter 6A

- Added paragraph recognizing the possible benefit of incorporating ITS systems and components into work zone applications to improve operations and safety.

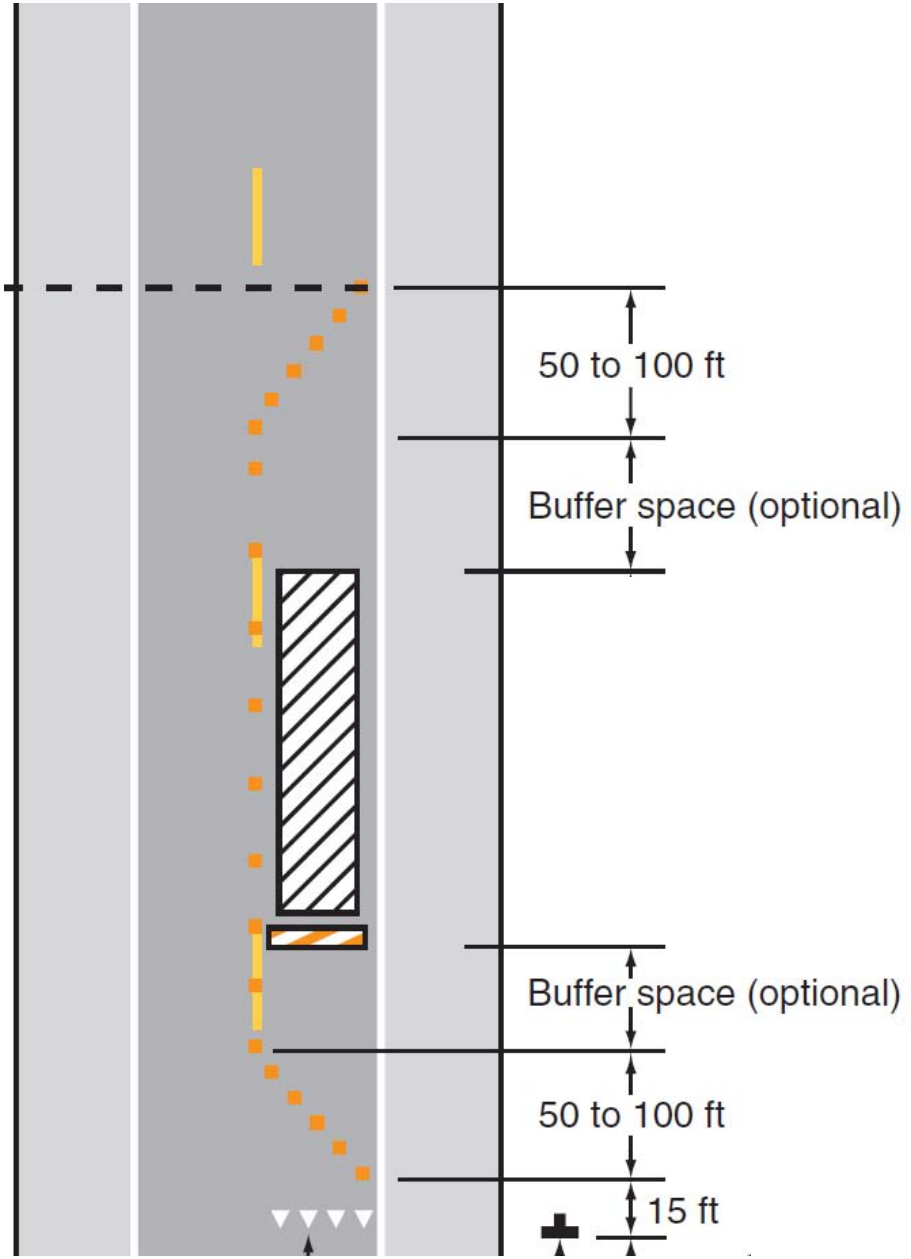
Chapter 6B

- **Fundamental Principles**
  - **Revised to emphasize importance of providing mobility as well as safety for road users and workers such as determining road user impacts and, if possible, scheduling work to minimize.**

Chapter 6C

- Added text to emphasis importance of a TCP for planned special events
- Added language to clarify flexibility in determining sign spacing in Fig. 6C-1
  - The distances contained in Table 6C-1 are approximate, are intended for guidance purposes only, and should be applied with engineering judgment. These distances should be adjusted for field conditions, if necessary, by increasing or decreasing the recommended distances

Guidance on lengths of short tapers and downstream tapers



Minimum length for one-lane, two-way traffic taper added to Table 6C-3

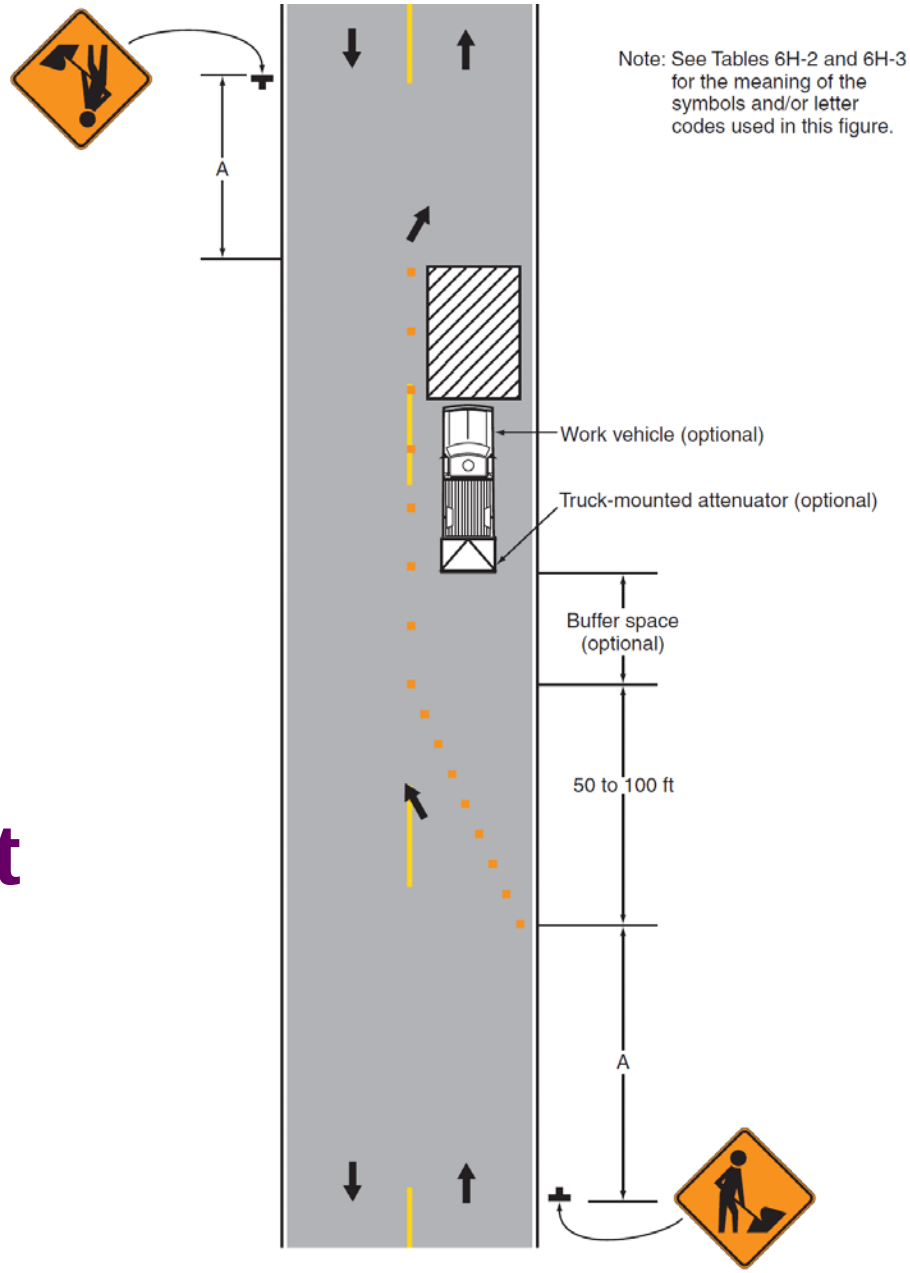
Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	100 feet per lane

Sec. 6C.10

Clarified OPTION for self-regulating traffic movement through a one-lane, 2-way constriction

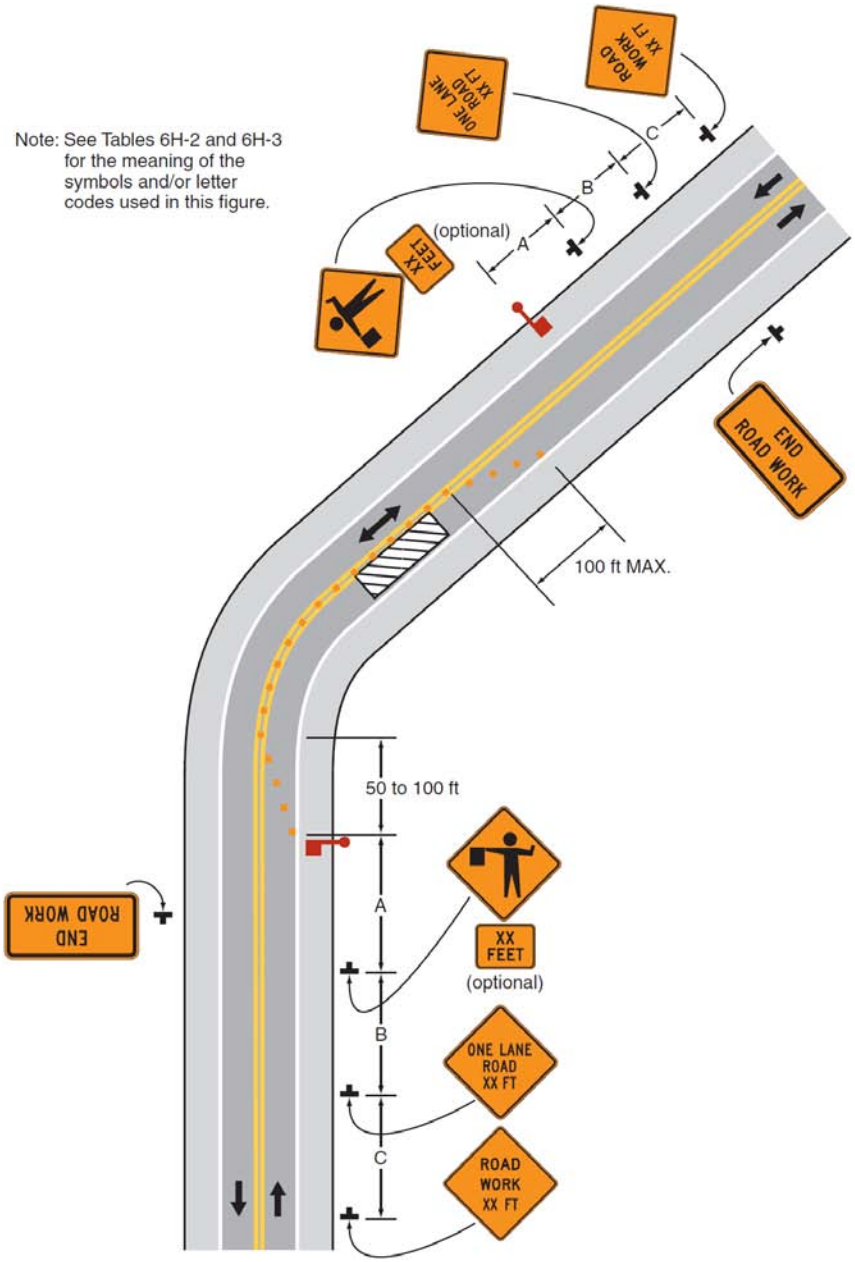
-If work space is short (adequate sight distance)

- If on a low-volume street



Sec. 6C-11

Two flaggers should be used for a one-lane, 2-way constriction unless TTC zone is short enough for the flagger to see from one end to the other



Chapter 6D

- Reorganized and revised provisions of pedestrian considerations
- Incorporated new requirements for high visibility safety apparel

High-visibility safety apparel

- Required for all workers within the public right of way

- Applies to all roads, not just those on the Federal-aid system

- Option for law enforcement and first responders to use new ANSI “public safety vests”

- Firefighters and law enforcement are exempted from the requirement under certain conditions

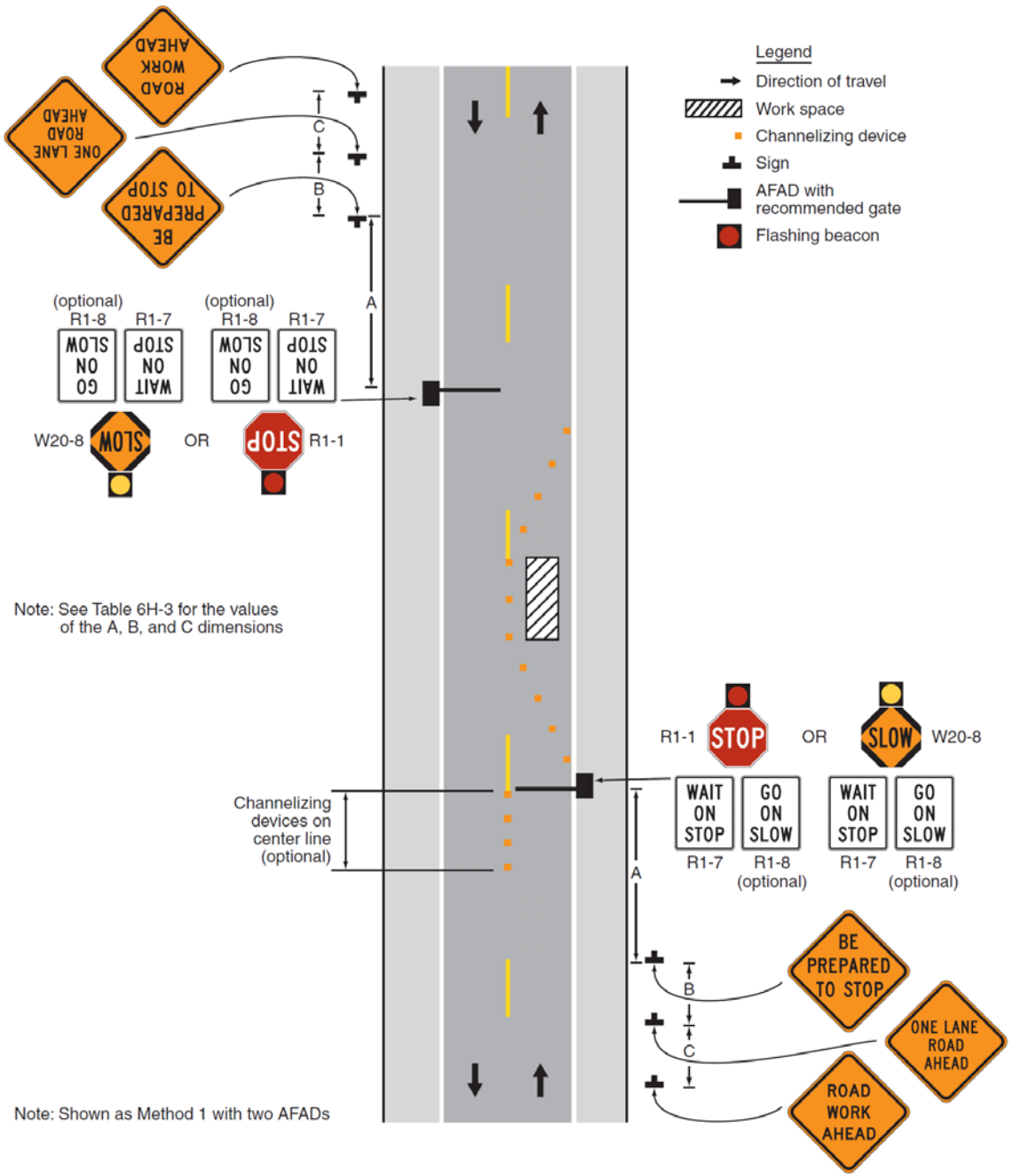
- December 31, 2011 compliance date

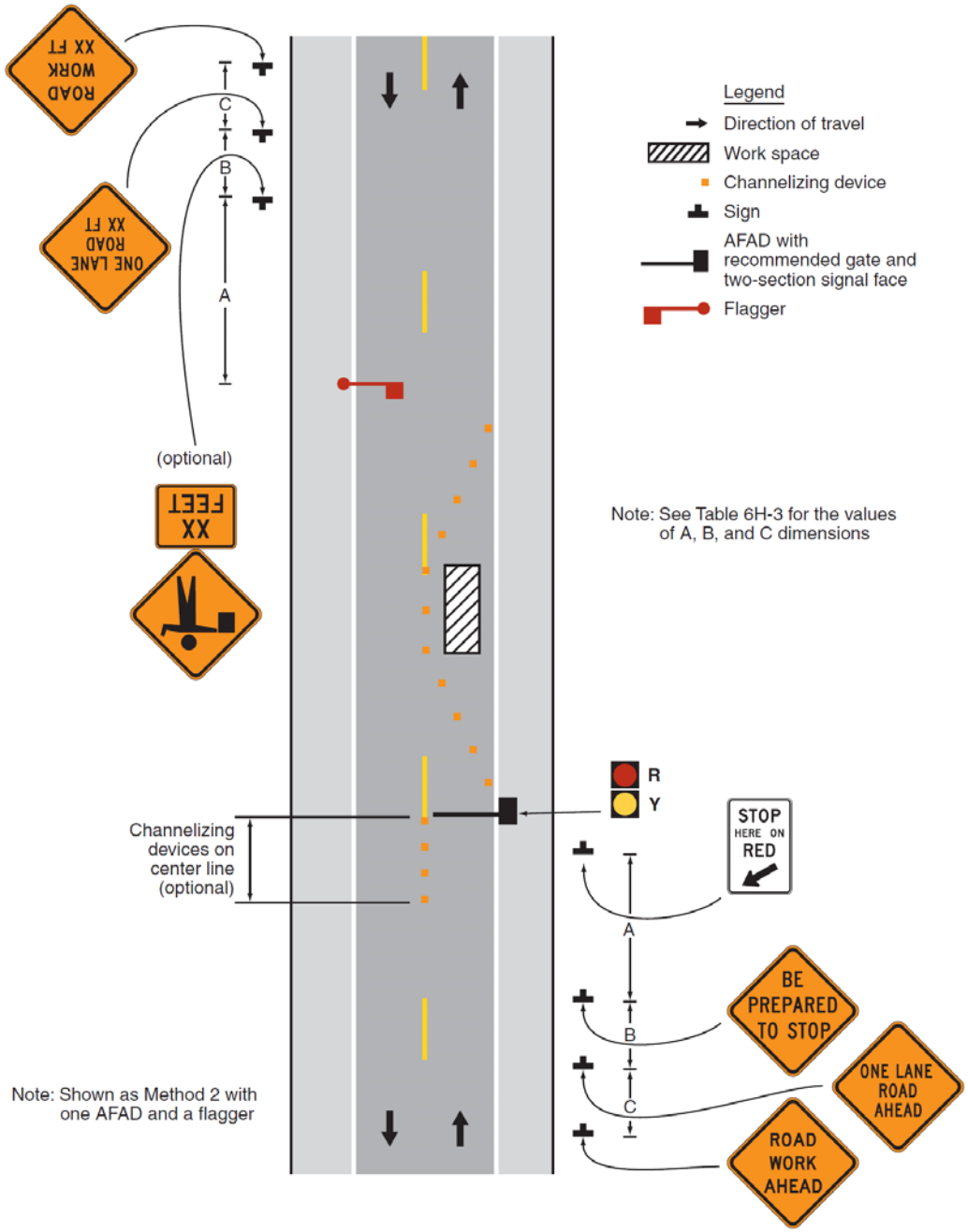
Chapter 6E

- **Incorporated Automated Flagger Assistance Devices**
  - **Interim Approval of devices had been in effect since 2004.**
  - **Two types were included: Type 1 – STOP/SLOW configuration, Type 2 – RED/YELLOW Lens method**

Automated flagger assistance device (AFAD)

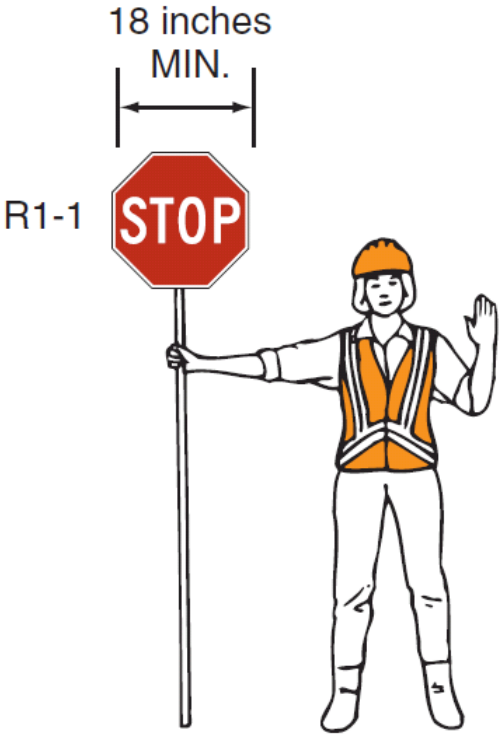
Type 1: STOP/SLOW paddle AFAD



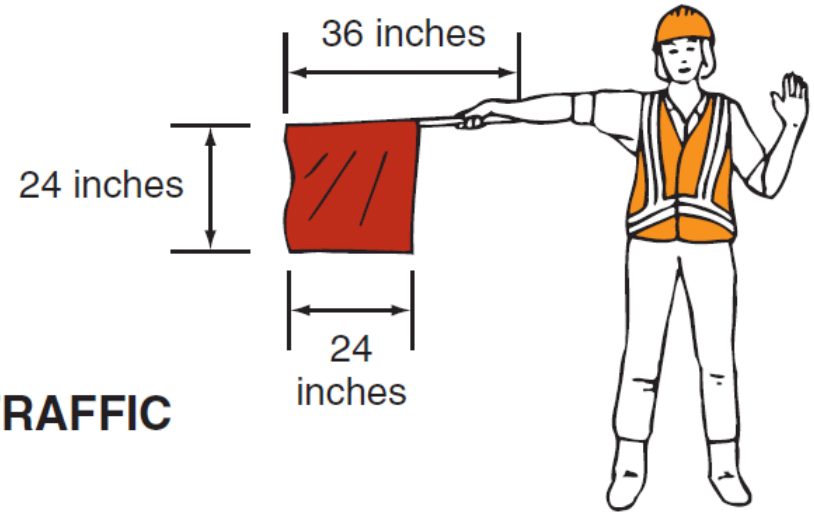


Type 2: Red/yellow lens AFAD

PREFERRED METHOD
STOP/SLOW Paddle



EMERGENCY SITUATIONS ONLY
Red Flag



TO STOP TRAFFIC

Flaggers shall use a paddle, flag, or AFAD, not just hand signals

Paddles should be placed on a rigid staff, high enough to be seen by approaching or stopped traffic

Chapter 6F

- Incorporated Min. Retroreflectivity requirement for signs used in TTC
- Added minimum sign sizes and sizes for freeways and expressways to Table 6F-1

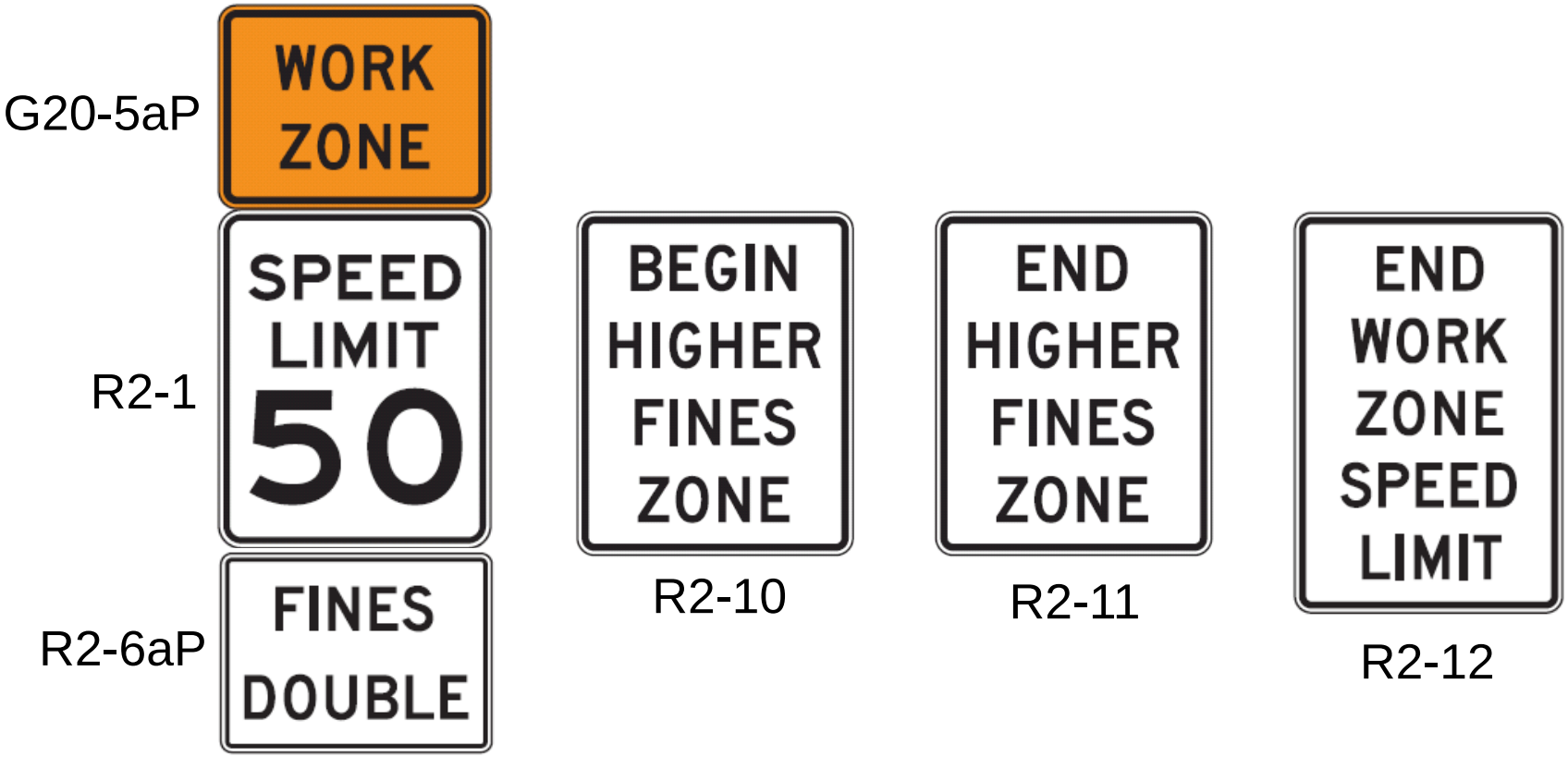
Deleted from the MUTCD

- Steady burn electric lamps
- Vehicle arresting systems

Retained in the MUTCD

- Floodlights
- Crash cushions
- Screens

New optional and recommended signs and plaques to accompany Speed Limit signs in TTC zones



Center Lane Closed Ahead symbol sign has been removed from the MUTCD

W9-3

W9-3a

New sign to warn road users of a change in the traffic pattern

W8-17

W8-17P

New symbol sign and supplemental plaque for shoulder drop-off

Section 6F.60

- **Portable Changeable Message Signs**
  - **Revised from Standard to Guidance statement concerning maximum number of phases that can be displayed**
  - **Incorporated many requirements on design and application from Section 2L**

Section 6F.61

- Arrow panel revised to arrow board
- New Standard statement:
  - Arrow board shall only be used to indicate a lane closure.

New alternating diamond display to indicate caution on an arrow board

Alternating Diamond Caution

Section 6F.72
Temporary lane separators

Section 6F.78
Temporary Markings

- Pavement markings or devices used to delineate path through the TTC zone when the permanent markings are either removed or obliterated during the work activities.
- Should not be left in place longer than 14 days
- Some allowable exceptions to normal longitudinal markings requirements

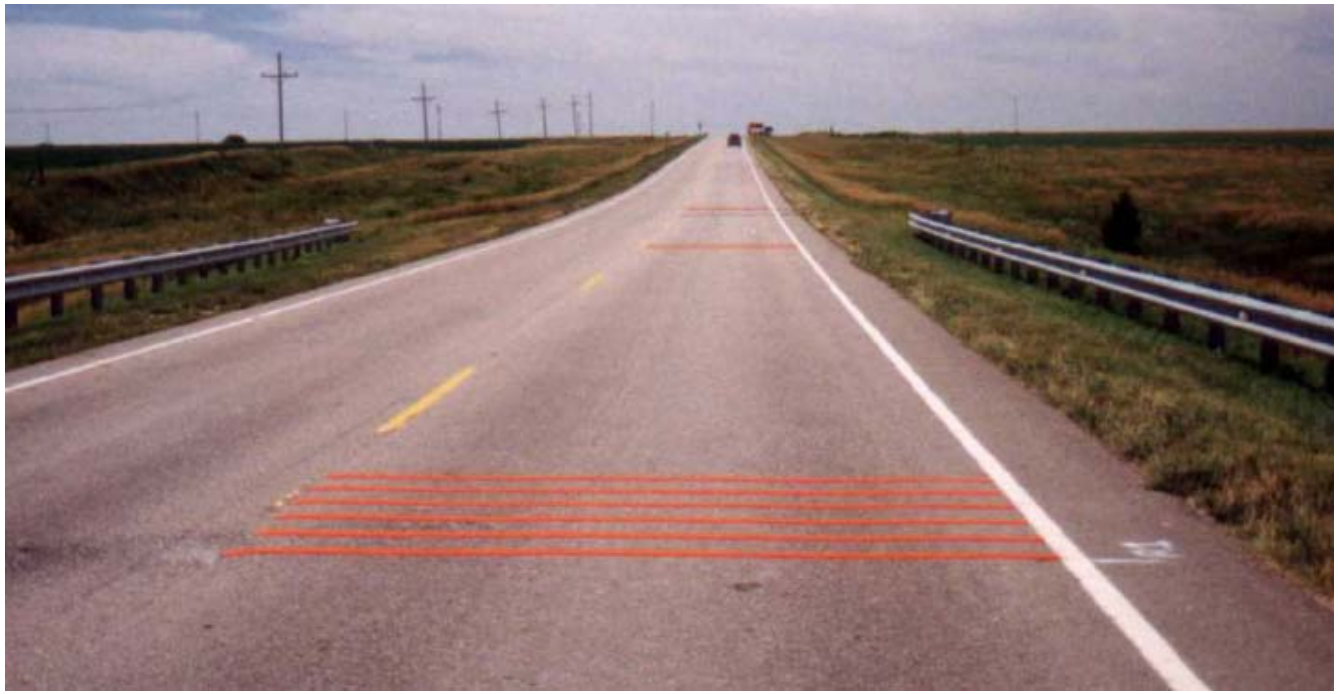
Section 6F.79
Temporary RPMs

- More provisions on color, patterns, and spacing, consistent with Part 3
  - Colors and patterns shall simulate the markings for which they substitute
  - May be used to substitute for solid lines
- Option to use a less expensive pattern of temporary RPMs to substitute for broken line segments
  - Should not be used more than 14 days

Section 6F.84
Preemption of temporary signals in TTC zones

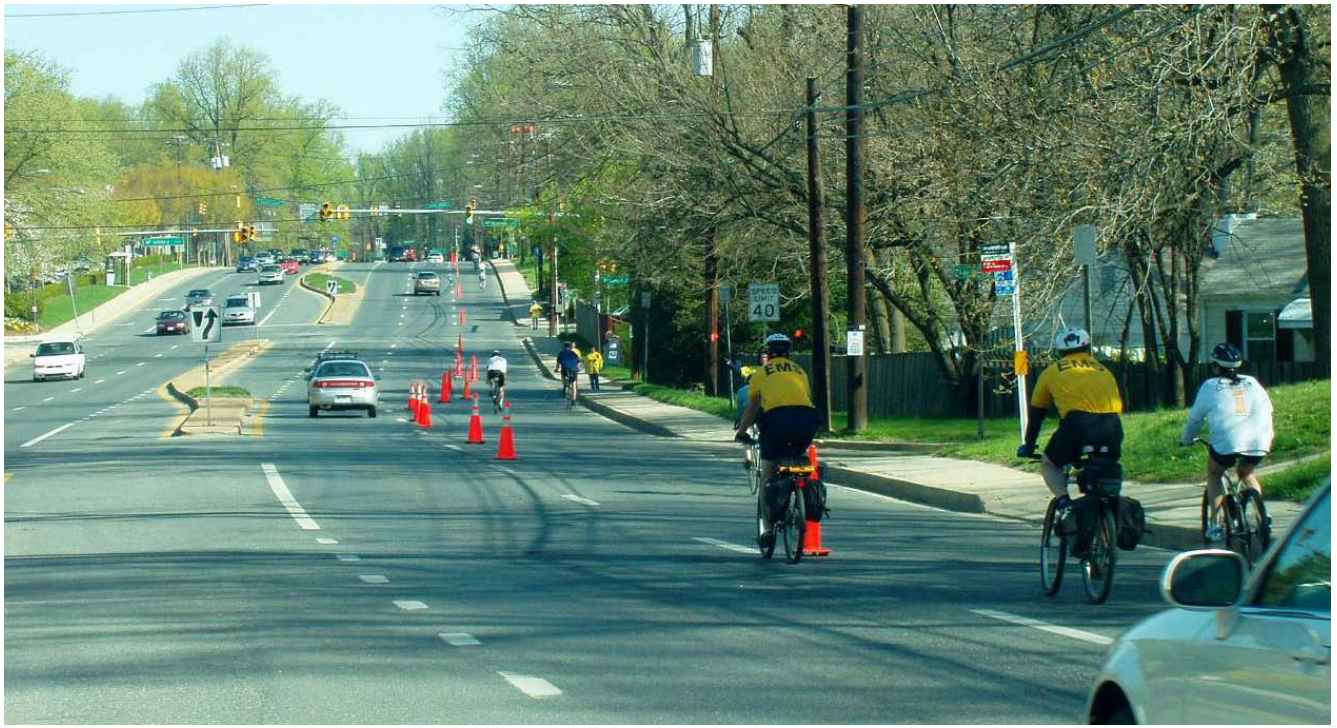
Revisions Incorporated into the 2009 MUTCD

Section 6F.87
Black and orange are acceptable colors for transverse rumble strips in TTC zones



Revisions Incorporated into the 2009 MUTCD

Chapter 6G
TTC plan should be developed for planned special events that will impact traffic

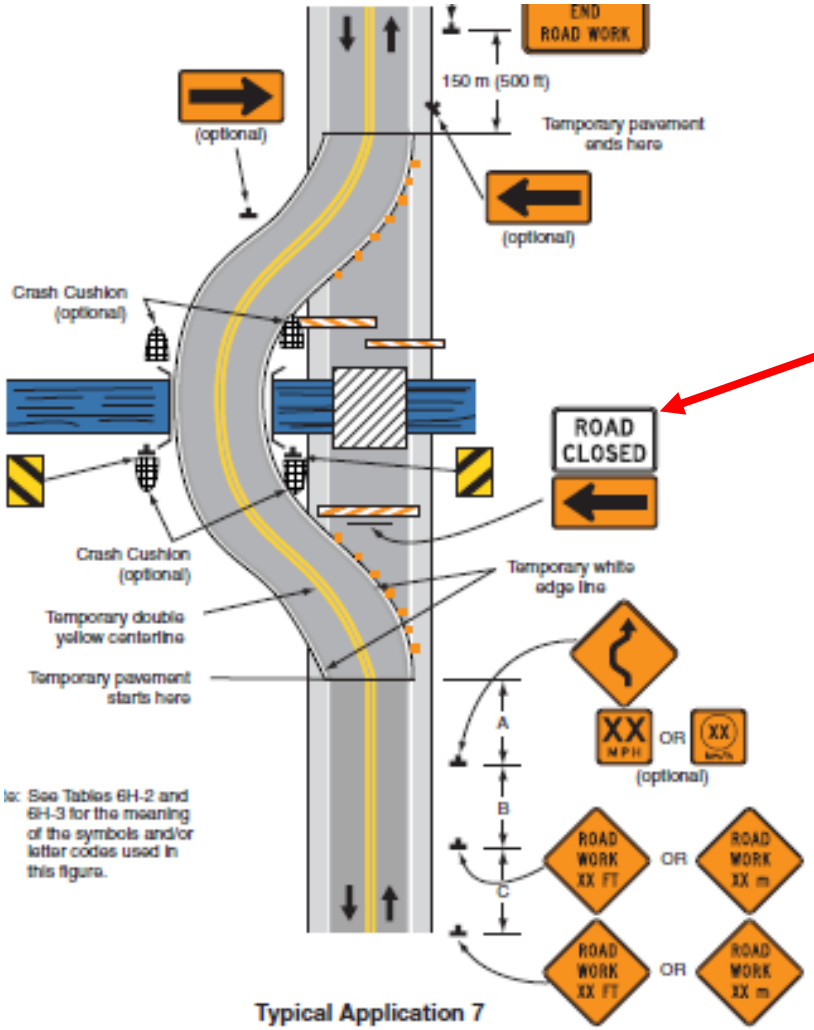


Bike race

Chapter 6H
Typical applications (TA)

- Except for the “Notes,” information in the TA drawings can generally be regarded as Guidance
- Notes have been revised on several TA’s to improve consistency

TA-7

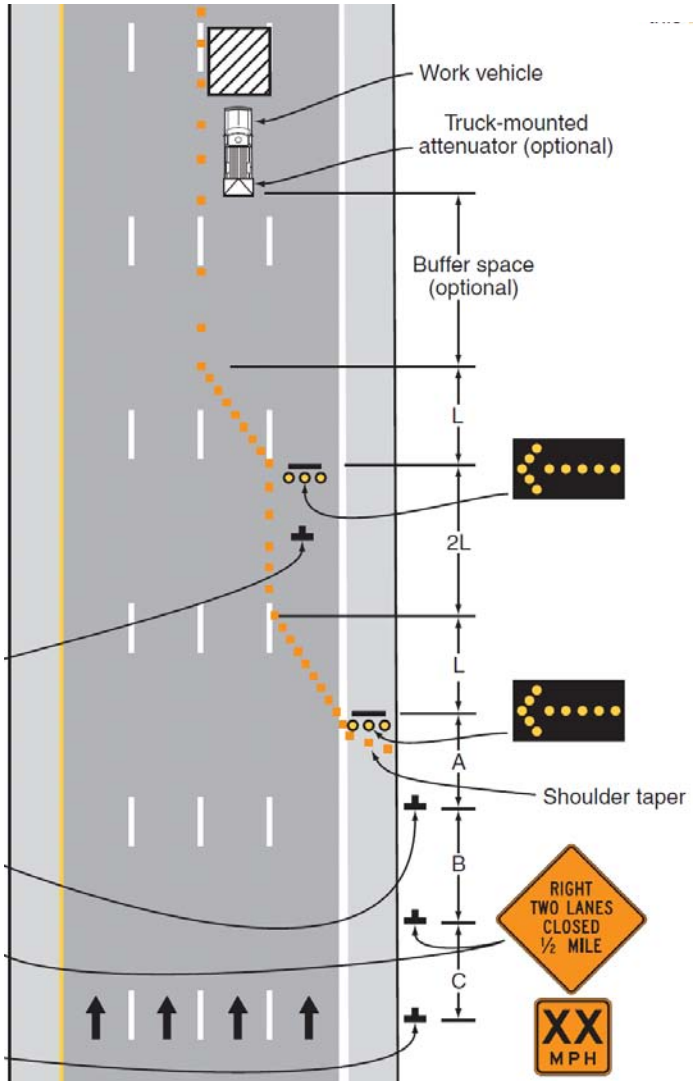


Typical Application 7

Removed in 2009 Edition

TAs with freeway lane closures

- TAs 37, 38, 39, 42, and 44
- Arrow board shall be used for all freeway lane closures
- Separate arrow board shall be used for each closed lane for multi-lane closures



Revisions Incorporated into the 2009 MUTCD

Chapter 6I

- Decided not to relocate as proposed in the NPA – emergency responders had already begun referencing 6I.
- Information concerning positioning of emergency vehicles was added

Provisions for traffic incident management

- A reference is made to the Incident Command System (ICS)
- All on-scene responders and news media personnel should wear high-visibility apparel
- Light sticks may be used in lieu of flares

Questions?

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