Navigating the MUTCD and 2023 Updates

October 22, 2025

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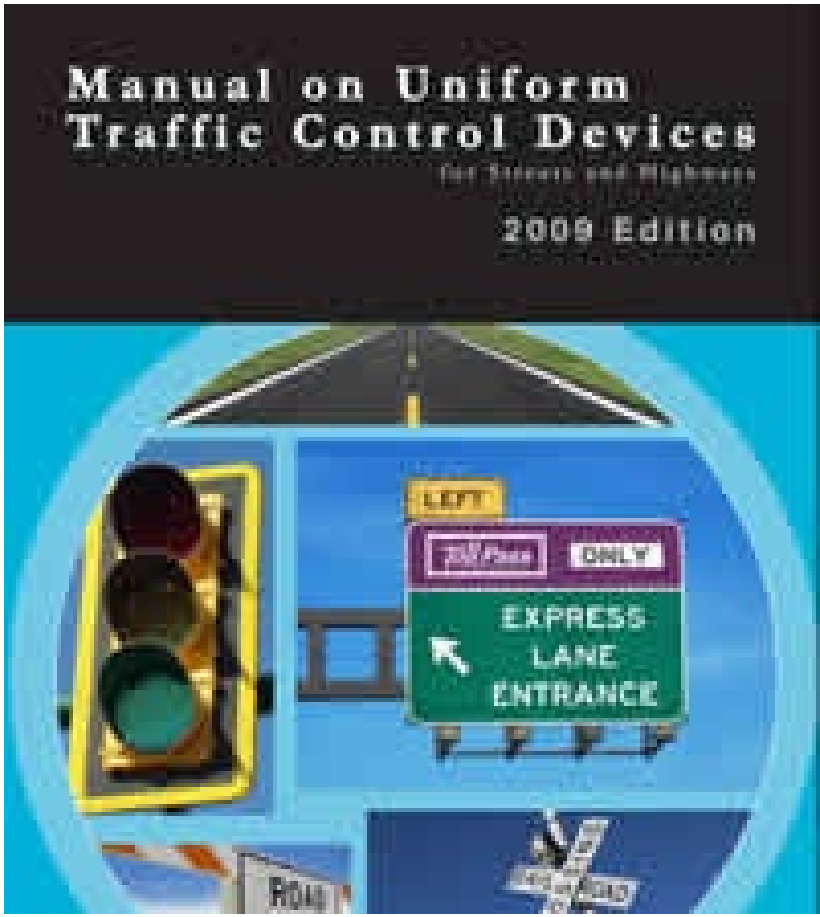
Navigating the MUTCD and 2023 Updates

- Objectives:
  - What is the MUTCD
  - When Does It Apply
  - Why and How to Use It
  - 2023 Updates to the MUTCD



MUTCD Beginnings

- Traffic Signs, signals and pavement markings varied greatly.
- 1925 – American Association of State Highway Officials (AASHO) Report on Interstate Highways.
- 1927 – AASHO published a manual
- 1930 – American Engineering Council published a manual for signs, pavement markings and signals for urban areas.

MUTCD Beginnings

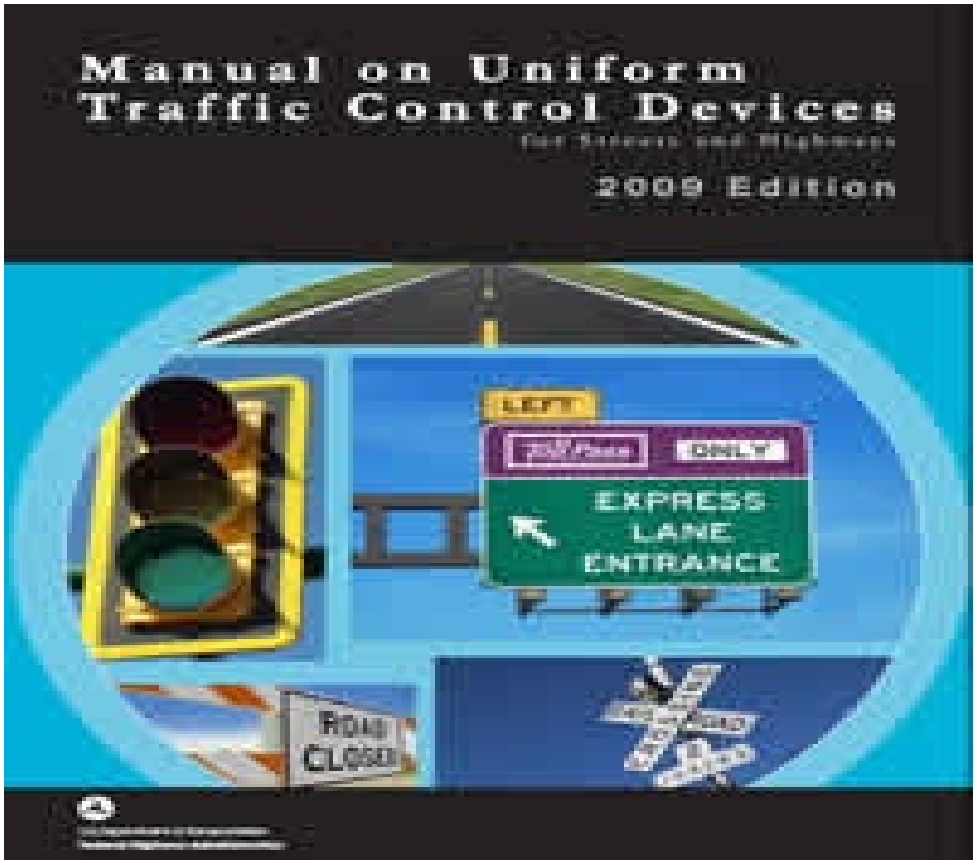
- 1935 (sign shapes, pavement markings)
- 1942 (wartime conditions)
- 1948 (significant changes; rounded alphabet)
- 1958 (new Interstate Highway System)
- 1961 (compliance for federal aid roads)
- 1971 (international signs/symbols)
- 1978 (railroad crossings/bicycle facilities)

MUTCD Beginnings

- 1988 (recreational/cultural/tourist)
- 2000 (metric units and tables/light rail)
- 2003 (editorial/pink signs)
- 2009 (focus on uniformity/toll roads/pcms)
- 2023 (over 400 updates)

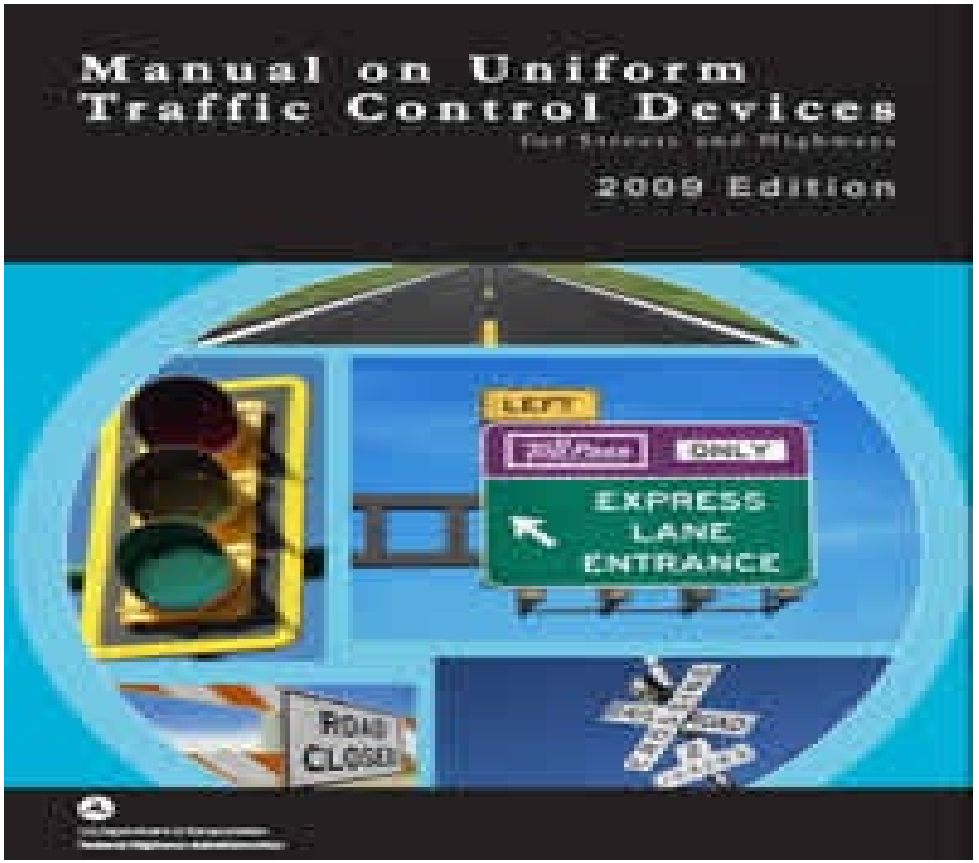
Navigating the MUTCD and 2023 Updates

- Manual on Uniform Traffic Control Devices (MUTCD)
  - Contains all national design, application and placement standards for traffic control devices and pavement markings
  - Provides a uniform language for all road users



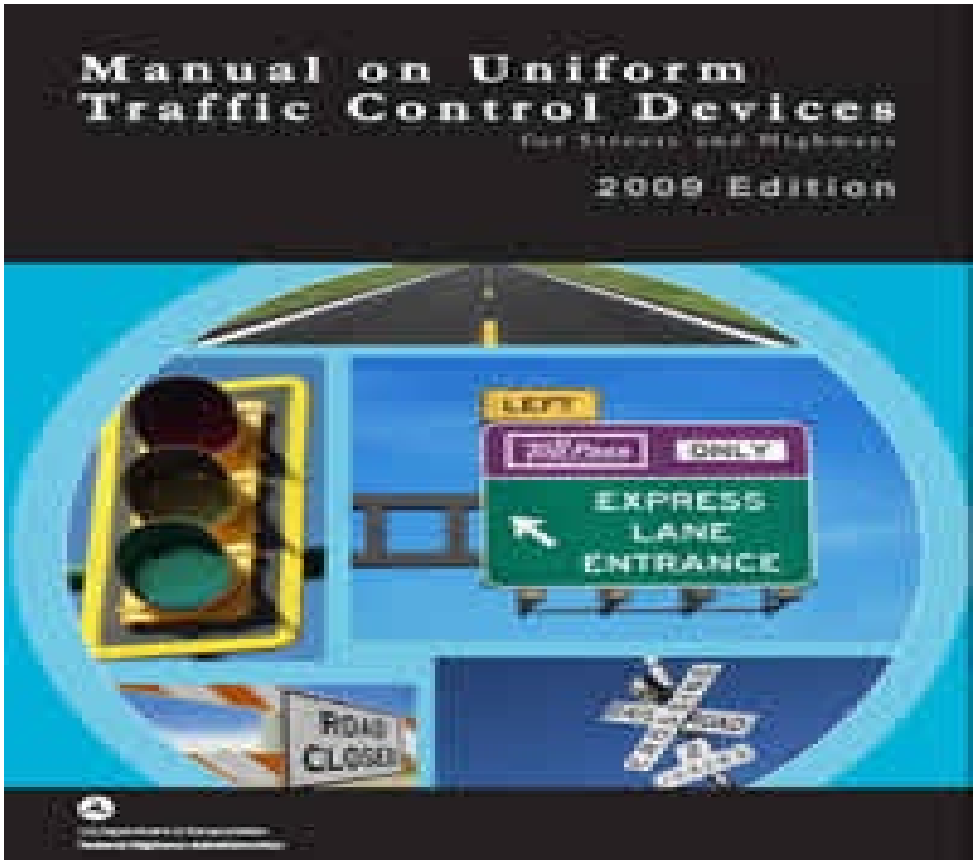
Navigating the MUTCD and 2023 Updates

- "The purpose of traffic control devices is to promote highway safety and efficiency by providing for the orderly movement of all road users on streets and highways through the Nation."



Navigating the MUTCD and 2023 Updates

- 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.



Why the MUTCD?

Sign color and shape must be visible at night.

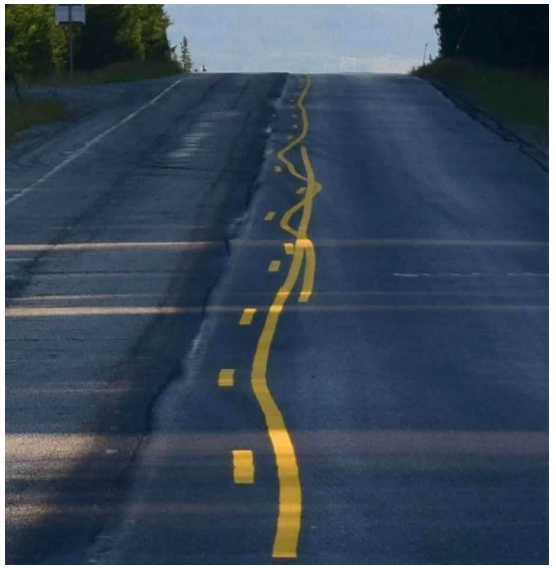
Streetlamps and highway lights are not replacements for retro reflectivity.

Why the MUTCD?

Why the MUTCD?

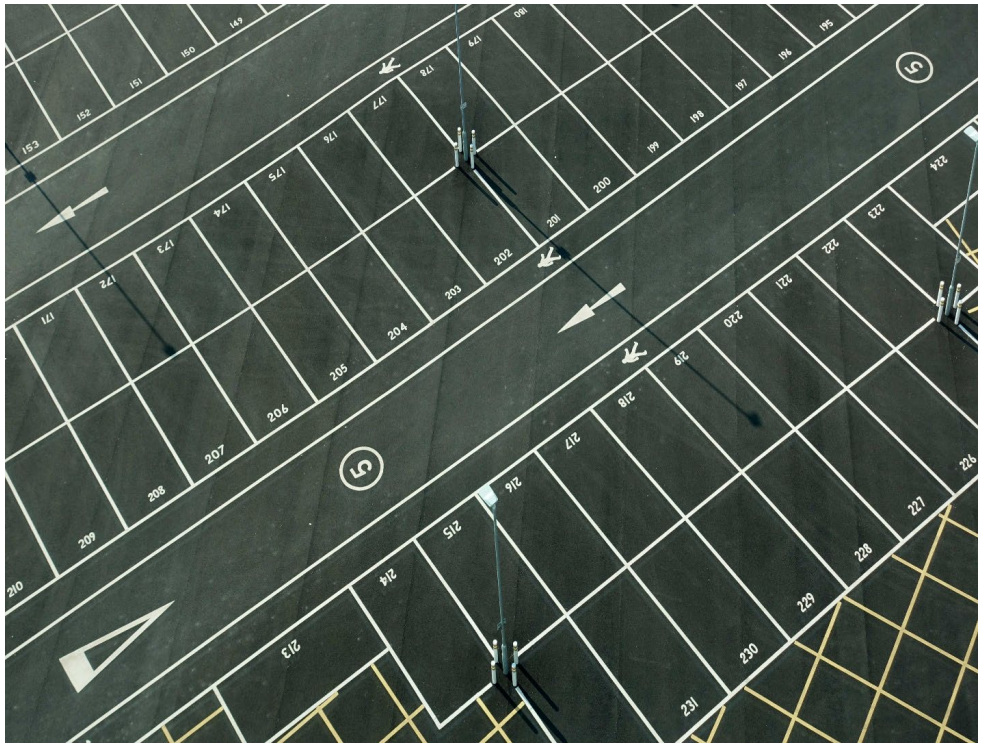
Why the MUTCD?

Why the MUTCD?



Navigating the MUTCD and 2023 Updates

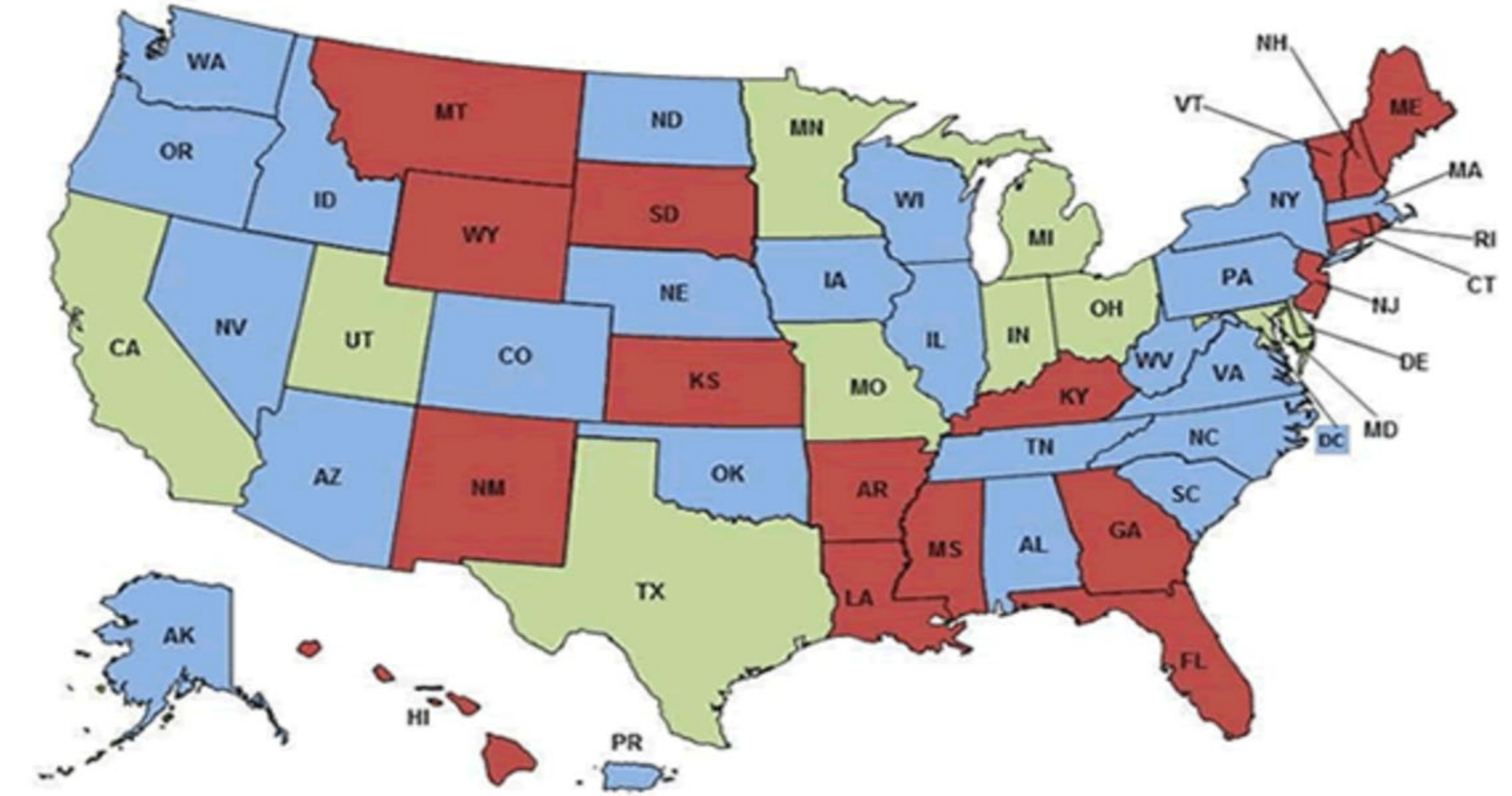
- Parking areas and their driving aisles are **not** subject to the specific requirements of the MUTCD.



Navigating the MUTCD and 2023 Updates

States were given the option of fully adopting the MUTCD or writing their own version of the MUTCD in substantial conformance with the national MUTCD.

Additionally, states were given the option of adopting the national MUTCD for use along with a State supplement.



Adoption of the national MUTCD (2009 Edition)

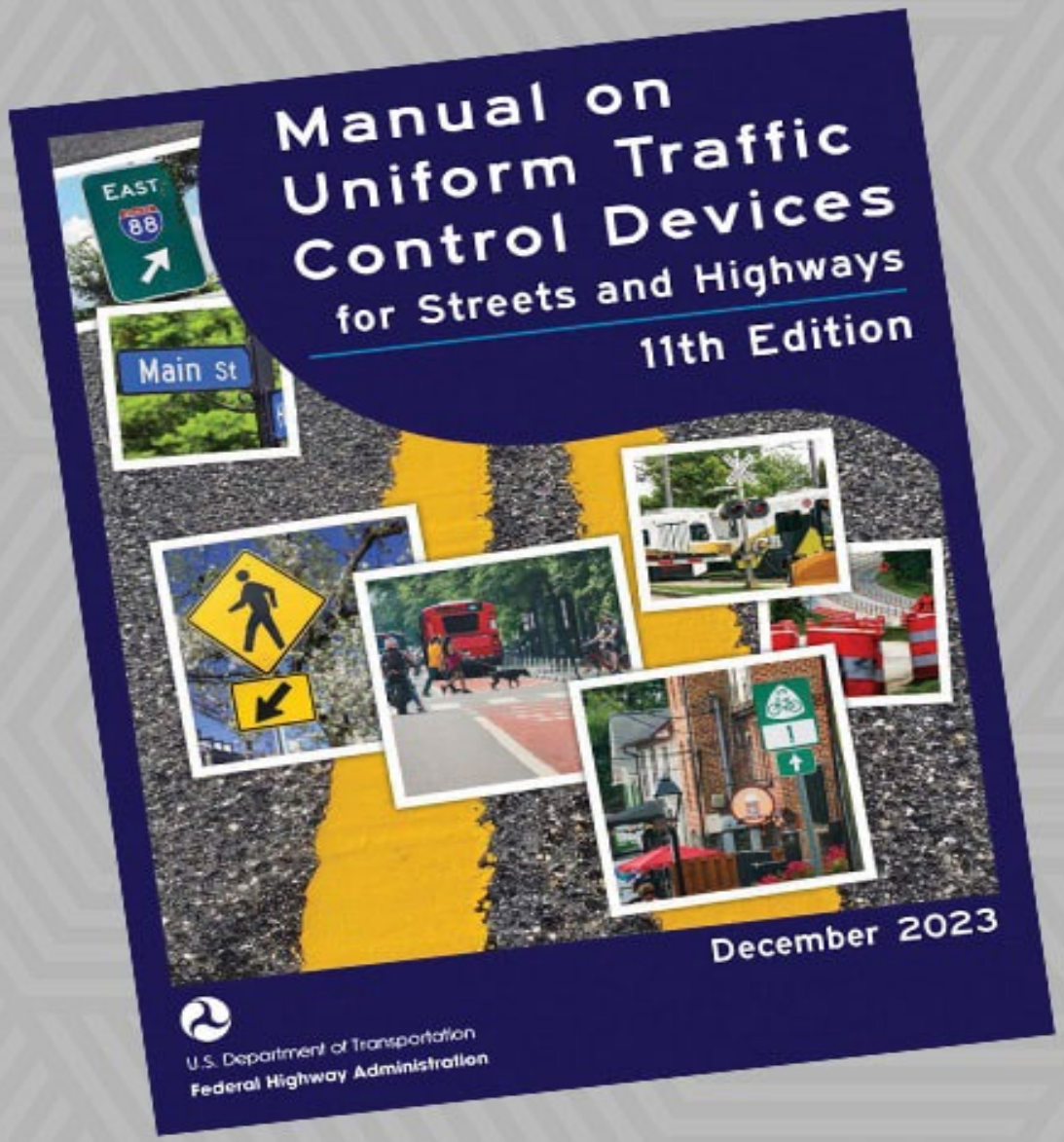
Adoption of the national MUTCD (2009 Edition) along with a State supplement(s)

Adoption of a State MUTCD (2009 Edition)

When Does the MUTCD Apply

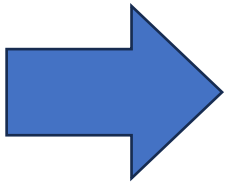
Eight states have completed the process of adopting the revised Manual on Uniform Traffic Control Devices (MUTCD) as of June 2025:

- *20 States are adopting the national standard without modification (Previously 17 States).*
- *10 States are opting for the adoption of a State-specific MUTCD*
- *22 States are continuing with a state supplement-based approach (Previously 24 States). States will be required to adopt the National Manual or have a State MUTCD/supplement that is in substantial conformance with the National Manual by January 18, 2026.*


Manual on Uniform Traffic Control Devices
for Streets and Highways
11th Edition
EAST
88
Main St
December 2023
U.S. Department of Transportation
Federal Highway Administration

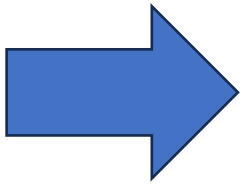
MUTCD Methodology

Final Rule was published on December 19, 2023



Became effective on January 18, 2024

States must adopt within 2 years of the effective date



Now referenced by Edition, not by year

MUTCD Parts

- Part 1 – General
- Part 2 – Signs
  - 2A – General
  - 2B – Regulatory Signs, Barricades, and Gates
  - 2C – Warning Signs and Object Markers
  - 2D – Guide Signs: Conventional Roads
  - 2E – Guide Signs: Freeways and Expressways

MUTCD Parts

- Part 2 – Signs
  - 2F – Toll Road Signs
  - 2G-2H – Preferential and Managed Lane Signs and General Information Signs
  - 2I-2N – General Service Signs, Specific Service Signs, Tourist-Oriented Directional Signs, Changeable Message Signs, Recreational and Cultural Interest Area Signs and Emergency Management Signing

MUTCD Parts

- Part 3 – Pavement Markings
- Part 4 – Highway Traffic Signs
- Part 5 – Traffic Control Device Considerations for Automated Vehicles
- Part 6 – Temporary Traffic Control
- Part 7 – Traffic Control for School Areas
- Part 8 – Traffic Control for Railroad and Light Rail Transit Grade Crossings
- Part 9 – Traffic Control for Bicycle Facilities

MUTCD Parts

To be effective, traffic control devices must meet five basic requirements:

1. Fulfill a Need
2. Command Attention
3. Convey a Clear, Simple Meaning
4. Command Respect
5. Give Adequate Time for Response

MUTCD Terms

- Standard (“shall”)
  - A mandatory condition, compliance required
- Guidance (“should”)
  - An advisory condition, compliance required
- Option (“may”)
  - A permissive condition or practice, permitted
- Support
  - An informational statement that does not convey any enforceable condition

MUTCD 11th Edition Updates

- MUTCD 11th Edition (1161 pages)
- MUTCD 10th Edition (864 pages)
- An increase of approximately 34%

Navigating the MUTCD and 2023 Updates

Green Bicycle Pavement Markings

Navigating the MUTCD and 2023 Updates

Red Bus Pavement Markings

Navigating the MUTCD and 2023 Updates

Purple Toll Pavement Markings

MUTCD 11th Edition Updates

Part 1 – Introduction and General Information

- Clarifies that all documentation related to traffic control devices is a “Supplement to the MUTCD” and must be in substantial conformance.
- Significant changes / restrictions to Experimentation Process (Welcome Signs)

MUTCD 11th Edition Updates

Part 2 – Signs

- Speed Limit Signs (Speed Culture)
- Horizontal Alignment Warning Signs
- Changeable Message Signs (CMS), related to Non-TCD purposes

MUTCD 11th Edition Updates

Part 2 – Signs

- Speed Limit Signs (Speed Culture)

There has been a significant shift in terms of speed limit settings. Specifically, there is less reliance or emphasis on the 85th percentile speed. This is especially true on urban and secondary roads. Going forward, consideration should be given to additional factors such as the characteristics of a roadway or even crash experience. This plays a more critical role in how best to determine speed limits.

MUTCD 11th Edition Updates

Part 3 – Markings

- Chevrons required for gore areas (Autonomous Vehicles / Split Lanes)

MUTCD 11th Edition Updates

Part 4 – Signals

- New Chapter added Rectangular Rapid Flashing Beacons (RRFB) (Crosswalks)
- Bike Signals added

MUTCD 11th Edition Updates

2009 MUTCD Section 2B.13

Standard:

01 Speed zones (other than statutory speed limits) shall only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall include an analysis of the current speed distribution of free-flowing vehicles.

11th Edition Section 2B.21

Standard:

06 Speed zones (other than statutory speed limits) shall only be established on the basis of an engineering study that has been performed in accordance with traffic engineering practices. The engineering study shall consider the roadway context.

MUTCD 11th Edition Updates

Guidance:

07 *Among the factors that should be considered when conducting an engineering study for establishing or reevaluating speed limits within speed zones are the following:*

- *A. Roadway environment (such as roadside development, number and frequency of driveways and access points, and land use), functional classification, public transit volume and location or frequency of stops, parking practices, and pedestrian and bicycle facilities and activity;*
- *B. Roadway characteristics (such as lane widths, shoulder condition, grade, alignment, median type, and sight distance);*
- *C. Geographic context (such as an urban district, rural town center, non-urbanized rural area, or suburban area), and multi-modal trip generation;*
- *D. Reported crash experience for at least a 12-month period;*
- *E. Speed distribution of free-flowing vehicles including the pace, median (50th-percentile), and 85th-precentile speeds; and*
- *F. A review of past speed studies to identify any trends in operating speeds.*

08 *When the 85th-percentile speed is appreciably greater than the posted speed limit, and the roadway context does not support setting a higher speed limit, the engineering study should consider whether changes to geometric features, enforcement, and/or other speed-reduction countermeasures might improve compliance with the posted speed limit. A similar approach should be used if the results of past speed studies indicate that the 85th-percentile speed has consistently increased.*

09 *On urban and suburban arterials, and on rural arterials that serve as main streets through developed areas of communities, the 85th-percentile speed should not be used to set speed limits without consideration of all factors described in Paragraph 7 of this Section.*

MUTCD 11th Edition Updates

Table 2C-4. Guidelines for Advance Placement of Warning Signs

Posted or 85th-Percentile Speed	Advance Placement Distance[1]								
	Condition A: Speed reduction and lane changing in heavy traffic[2]	Condition B: Deceleration to the listed advisory speed (mph) for the condition							
		0[3]	10[4]	20[4]	30[4]	40[4]	50[4]	60[4]	70[4]
20 mph	225 ft	100 ft[6]	N/A[5]	—	—	—	—	—	—
25 mph	325 ft	100 ft[6]	N/A[5]	N/A[5]	—	—	—	—	—
30 mph	460 ft	100 ft[6]	N/A[5]	N/A[5]	—	—	—	—	—
35 mph	565 ft	100 ft[6]	N/A[5]	N/A[5]	N/A[5]	—	—	—	—
40 mph	670 ft	125 ft	100 ft[6]	100 ft[6]	N/A[5]	—	—	—	—
45 mph	775 ft	175 ft	125 ft	100 ft[6]	100 ft[6]	N/A[5]	—	—	—
50 mph	885 ft	250 ft	200 ft	175 ft	125 ft	100 ft[6]	—	—	—
55 mph	990 ft	325 ft	275 ft	225 ft	200 ft	125 ft	N/A[5]	—	—
60 mph	1,100 ft	400 ft	350 ft	325 ft	275 ft	200 ft	100 ft[6]	—	—
65 mph	1,200 ft	475 ft	450 ft	400 ft	350 ft	275 ft	200 ft	100 ft[6]	—
70 mph	1,250 ft	550 ft	525 ft	500 ft	450 ft	375 ft	275 ft	150 ft	—
75 mph	1,350 ft	650 ft	625 ft	600 ft	550 ft	475 ft	375 ft	250 ft	100 ft[6]

[1] The distances are adjusted for a sign legibility distance of 180 feet for Condition A. The distances for Condition B have been adjusted for a sign legibility distance of 250 feet, which is appropriate for an alignment warning symbol sign. For Conditions A and B, warning signs with less than 6-inch legend or more than four words, a minimum of 100 feet should be added to the advance placement distance to provide adequate legibility of the warning sign.

[2] Typical conditions are locations where the road user must use extra time to adjust speed and change lanes in heavy traffic because of a complex driving situation. Typical signs are Merge and Right Lane Ends. The distances are determined by providing the driver a PRT of 14.0 to 14.5 seconds for vehicle maneuvers (2005 AASHTO Policy, Exhibit 3-3, Decision Sight Distance, Avoidance Maneuver E) minus the legibility distance of 180 feet for the appropriate sign.

[3] Typical condition is the warning of a potential stop situation. Typical signs are Stop Ahead, Yield Ahead, Signal Ahead, and Intersection Warning signs. The distances are based on the 2005 AASHTO Policy, Exhibit 3-1, Stopping Sight Distance, providing a PRT of 2.5 seconds, a deceleration rate of 11.2 feet/second^2, minus the sign legibility distance of 180 feet.

[4] Typical conditions are locations where the road user must decrease speed to maneuver through the warned condition. Typical signs are Turn, Curve, Reverse Turn, or Reverse Curve. The distance is determined by providing a 2.5 second PRT, a vehicle deceleration rate of 10 feet/second^2, minus the sign legibility distance of 250 feet.

[5] No suggested distances are provided for these speeds, as the placement location is dependent on site conditions and other signing. An alignment warning sign may be placed anywhere from the point of curvature up to 100 feet in advance of the curve. However, the alignment warning sign should be installed in advance of the curve and at least 100 feet from any other signs.

[6] The minimum advance placement distance is listed as 100 feet to provide adequate spacing between signs.

MUTCD 11th Edition Updates

Table 2C-3. Guidelines for Advance Placement of Warning Signs

Posted or 85th-Percentile Speed	Advance Placement Distance[1]									
	Condition A: Speed reduction and lane changing in heavy traffic[2]	Condition B: Deceleration to the listed advisory speed (mph) for the condition								
		0[3]	10[4]	20[4]	30[4]	40[4]	50[4]	60[4]	70[4]	80[4]
20 mph	225 ft	115 ft	N/A[5]	–	–	–	–	–	–	–
25 mph	325 ft	155 ft	N/A[5]	N/A[5]	–	–	–	–	–	–
30 mph	460 ft	200 ft	N/A[5]	N/A[5]	–	–	–	–	–	–
35 mph	565 ft	250 ft	N/A[5]	N/A[5]	N/A[5]	–	–	–	–	–
40 mph	670 ft	305 ft	100 ft[6]	100 ft[6]	N/A[5]	–	–	–	–	–
45 mph	775 ft	360 ft	125 ft	100 ft[6]	100 ft[6]	N/A[5]	–	–	–	–
50 mph	885 ft	425 ft	200 ft	175 ft	125 ft	100 ft[6]	–	–	–	–
55 mph	990 ft	495 ft	275 ft	225 ft	200 ft	125 ft	N/A5	–	–	–
60 mph	1,100 ft	570 ft	350 ft	325 ft	275 ft	200 ft	100 ft[6]	–	–	–
65 mph	1,200 ft	645 ft	450 ft	400 ft	350 ft	275 ft	200 ft	100 ft[6]	–	–
70 mph	1,250 ft	730 ft	525 ft	500 ft	450 ft	375 ft	275 ft	150 ft	–	–
75 mph	1,350 ft	820 ft	625 ft	600 ft	550 ft	475 ft	375 ft	250 ft	100 ft[6]	–
80 mph	1,475 ft	910 ft	725 ft	700 ft	625 ft	550 ft	450 ft	350 ft	200 ft	–
85 mph	1,600 ft	1,010 ft	825 ft	800 ft	750 ft	675 ft	575 ft	450 ft	300 ft	150 ft

MUTCD 11th Edition Updates

Table 2C-5. Horizontal Alignment Sign Selection

Type of Horizontal Alignment Sign	Difference Between Speed Limit and Advisory Speed				
	5 mph	10 mph	15 mph	20 mph	25 mph or more
Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to determine which sign to use)	Recommended	Required	Required	Required	Required
Advisory Speed Plaque (W13-1P)	Recommended	Required	Required	Required	Required
Chevrons (W1-8) and/or One Direction Large Arrow (W1-6)	Optional	Recommended	Required	Required	Required
Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp	Optional	Optional	Recommended	Required	Required

Note: Required means that the sign and/or plaque shall be used, recommended means that the sign and/or plaque should be used, and optional means that the sign and/or plaque may be used.

See Section 2C.06 for roadways with less than 1,000 ADT.

MUTCD 11th Edition Updates

Table 2C-4. Application of Traffic Control Devices for Changes in Horizontal Alignment

A - Determination of the Need for Devices for Changes in Horizontal Alignment[1]

Roadway Type	AADT			
	Less than 1,000	1,000-2,999	3,000-3,999	Greater than 3,999
Freeways and Expressways	Required	Required	Required	Required
Arterial or Collector without Pavement Markings	Optional	Recommended	Required	Required
Arterial or Collector with Pavement Markings[2]	Optional	Recommended	Recommended	Required
All other roadways	Optional	Optional	Optional	Optional

[1] If devices are determined to be needed, the selection of the device(s) is based on Chart B below.

[2] An arterial or collector is considered to have pavement markings when either a center line, edge lines, or both are present.

B - Selection of Devices for Changes in Horizontal Alignment

Speed Differential[3]	Devices for Change in Horizontal Alignment[3]
5 mph	Pavement markings or advance horizontal alignment warning sign on paved roadways. Advance horizontal alignment warning sign on unpaved roadways.[4]
10 mph	Advance horizontal alignment warning sign
15 mph	Delineators[5] and advance horizontal alignment warning sign
20 mph or more	Chevrons[5] and advance horizontal alignment warning sign

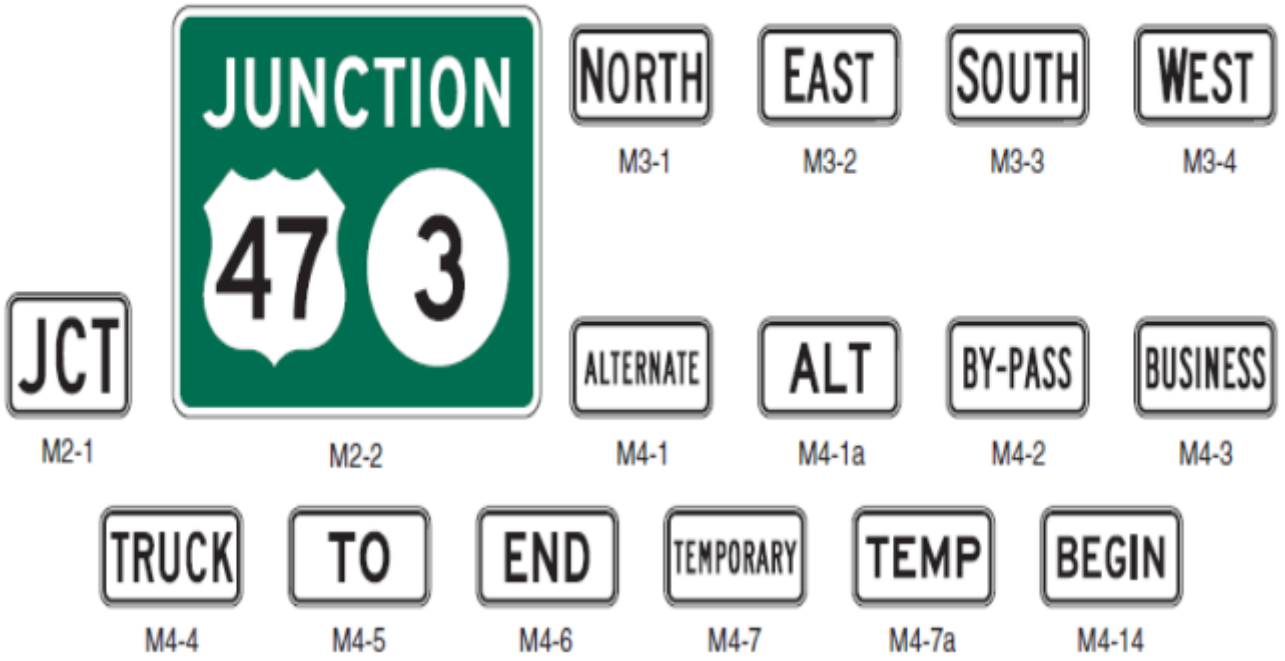
[3] The provisions for the use of Horizontal Alignment warning signs and devices are contained in Section 2C.06. The need for devices is determined by Chart A above.

[4] A roadway is considered to have pavement markings when either a center line, edge lines, or both are present.

[5] Section 2C.06 contains information about the use of a One Direction Large Arrow (W1-6) sign in place of or to supplement delineators and chevrons.

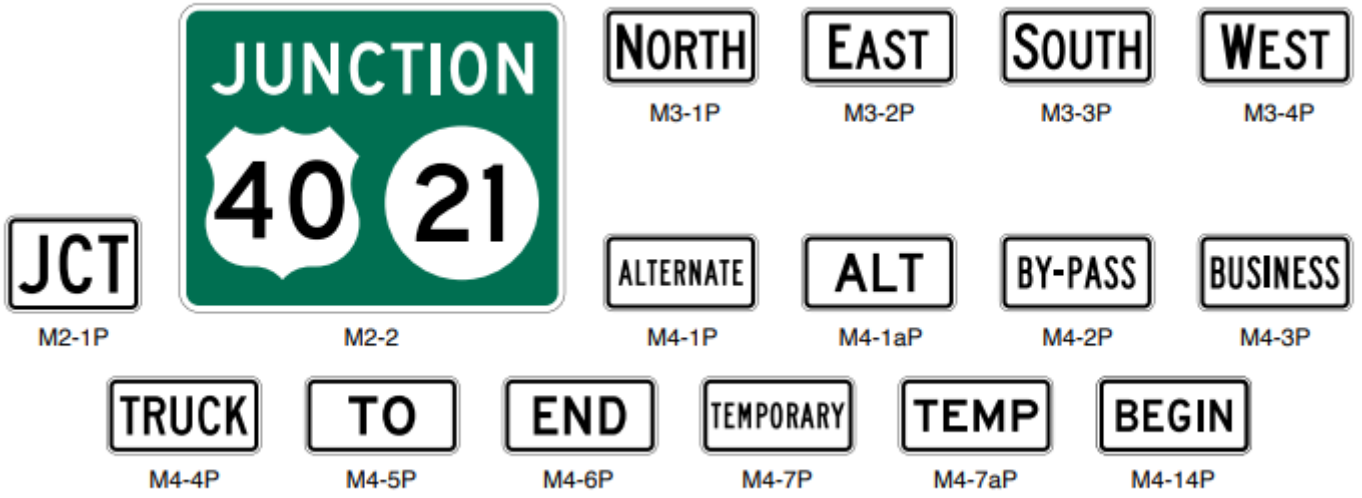
MUTCD 11th Edition Updates

Figure 2D-4. Route Sign Auxiliaries



MUTCD 11th Edition Updates

Figure 2D-5. Route Sign Auxiliary Plaques and Combination Junction Sign



December 2023

Sect. 2D.12 to 2D.15

MUTCD 11th Edition Updates

MUTCD 11th Edition

Updates and Changes

Part 3 – Pavement Markings

Standard: 6-inch wide line was not adopted

Normal Line Width: 4-6 inches was retained from 2009 Edition

MUTCD 11th Edition Updates

Section 3A.04 Functions, Widths, and Patterns of Longitudinal Pavement Markings

Standard:

01 **The general functions of longitudinal lines shall be as follows:**

- **A. A double line indicates maximum or special restrictions.**
- **B. A solid line discourages or prohibits crossing (depending on the specific application).**
- **C. A broken line indicates a permissive condition.**
- **D. A dotted lane line provides warning of a downstream change in lane function.**
- **E. A dotted line used as a lane line or edge line extension guides vehicles through an intersection, a taper area, or an interchange ramp area.**

02 **The widths and patterns of longitudinal lines shall be as follows:**

- **A. Normal line—4 to 6 inches wide.**
- **B. Wide line—at least twice the width of a normal line.**
- **C. Double line—two parallel lines separated by a discernible space. The pavement surface shall be visible between the lines in the same way that it is visible outside the lines, except where contrast markings are used in combination with the double line (see Section 3A.03).**
- **D. Broken line—normal width line segments separated by gaps.**
- **E. Dotted line—noticeably shorter line segments separated by shorter gaps than used for a broken line. The width of a dotted line extension shall be at least the same as the width of the line it extends.**

MUTCD 11th Edition Updates

MUTCD 11th Edition

Updates and Changes

Part 4 – Signals

MUTCD 11th Edition Updates

2009 Edition

Standard:

02 The design and operation of traffic control signals shall take into consideration the needs of pedestrian as well as vehicular traffic.

03 If engineering judgment indicates the need for provisions for a given pedestrian movement, signal faces conveniently visible to pedestrians shall be provided by pedestrian signal heads (see Chapter 4E) or a vehicular signal face(s) for a concurrent vehicular movement.

11th Edition

Standard:

02 Pedestrian signal heads shall be used in conjunction with vehicular traffic control signals under any of the following conditions, unless the pedestrian crossing is prohibited:

A. If the basis for traffic signal installation was justified by an engineering study and meeting either Warrant 4, Pedestrian Volume or Warrant 5, School Crossing (see Chapter 4C);
B. If an exclusive pedestrian signal phase or a leading pedestrian interval (LPI) is provided with all conflicting vehicular movements being stopped;
C. At an established signalized school crossing; or
D. Where there are existing pedestrian accommodations and engineering judgment determines that multi-phase signal indications (such as split-phase timing) would tend to confuse or cause conflicts with pedestrians using a crosswalk guided only by vehicular signal indications.

MUTCD 11th Edition Updates

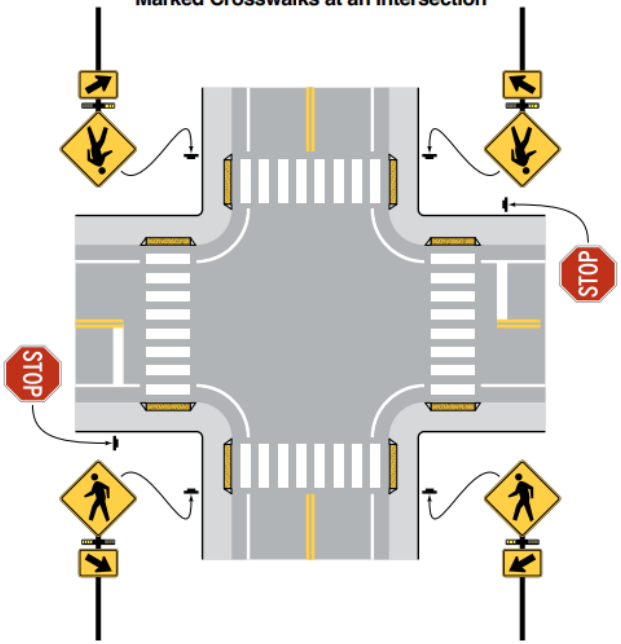
MUTCD 11th Edition

Updates and Changes

- New chapter adding Rectangular Rapid Flashing Beacons (RRFB) (Crosswalks)

MUTCD 11th Edition Updates

Figure 4L-1. Example of RRFBs at Uncontrolled, Marked Crosswalks at an Intersection



Notes:

1. When activated, the RRFBs on both approaches shall simultaneously commence operation of their rapid flashing indications and shall cease operation simultaneously.
2. If placed overhead, follow the requirements of Paragraph 8 of Section 4L.02, except that the signs may be placed approximately over the center of the intersection.

MUTCD 11th Edition Updates

MUTCD 11th Edition

Updates and Changes

- Bike Signals added

MUTCD 11th Edition Updates

Section 4H.01 Use of Bicycle Signal Faces

Option:

01 A bicycle signal face may be used to provide separate control of a bicyclist movement for various situations, including the following:

A. To provide a protected bicycle signal phase or a leading or lagging bicycle interval;
B. To continue a through bicycle lane on the right-hand side of a mandatory right-turn lane (or on the left-hand side of a mandatory left-turn lane) that would otherwise be in non-compliance with Paragraph 1 of Section 9E.02 or Paragraph 7 of Section 9E.06;
C. To provide a bicycle interval for a counter-flow bicycle facility; or
D. To provide for unusual or unexpected arrangements of the bicyclist movement through complex intersections, conflict areas, or signal control.

02 A bicycle signal face may be used at a mid-block traffic control signal where there are no motor vehicle movements parallel to the bicycle crossing.

Figure 4H-1. Typical Arrangements of Bicycle Signal Faces

MUTCD 11th Edition Updates

MUTCD 11th Edition

Updates and Changes

Part 5 – Autonomous Vehicles (New) (Low Volume Roads) (Pedestrians)

- Addresses specific issues related to CAV's

MUTCD 11th Edition Updates

MUTCD 11th Edition

Updates and Changes

Part 6 – Temporary Traffic Control

Consolidation of Information and Deletion of Repetitive Material.

MUTCD 11th Edition Updates

MUTCD 11th Edition

- Several Standards were adjusted to Guidance to provide for more flexibility.
- Typical Applications now include drawings of Circular Intersections.

MUTCD 11th Edition Updates

- Devices necessary to assist a pedestrian to safely navigate a work zone, i.e., an audible device capable of giving verbal instructions or information for safe maneuvers through or around a temporary traffic control zone.

MUTCD 11th Edition Updates

Part 7 – Schools

*School Zone Sign Color (Fluorescent Yellow-Green)

*School Speed Limit Signs – Beacons (cannot be mounted inside the border of a school speed limit sign; must be placed above, below or beside sign)

MUTCD 11th Edition Updates

Part 7 – Schools

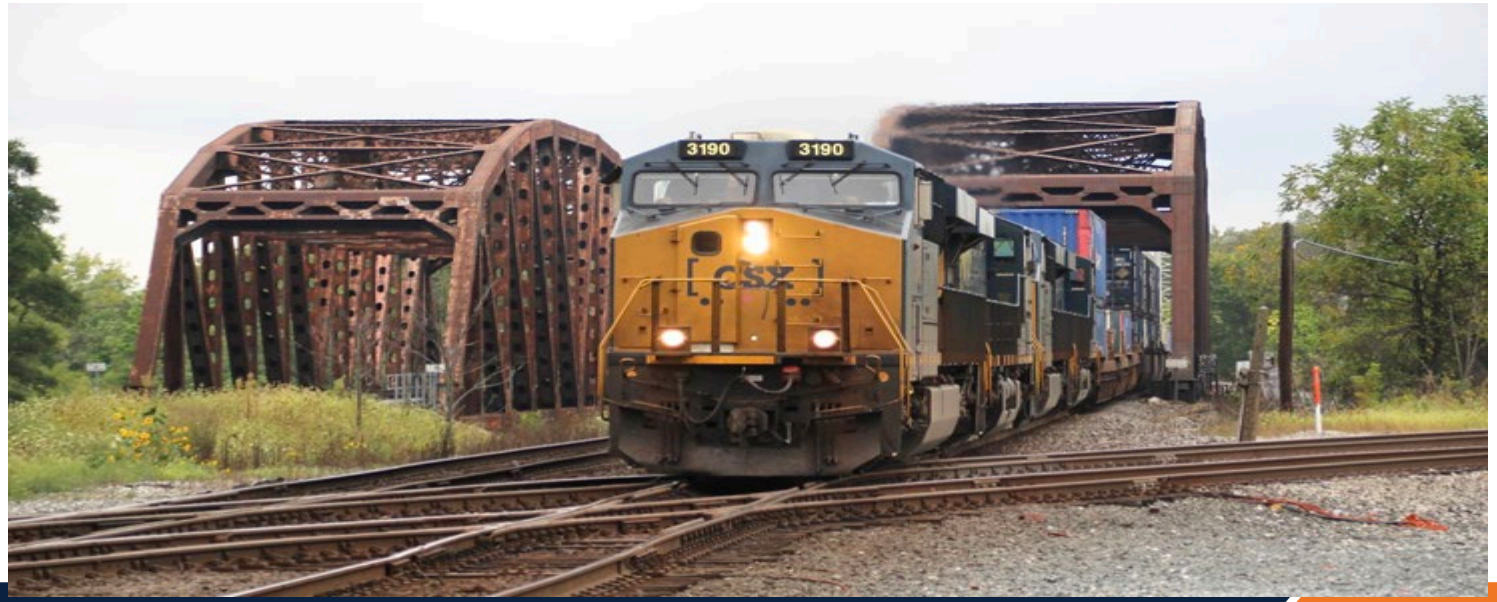
*Changeable Message School Speed Limit Sign (only during applicable hours; avoid alternation)

*School Speed Limit Signs – Beacons (cannot be mounted inside the border of a school speed limit sign; must be placed above, below or beside sign)

MUTCD 11th Edition Updates

Part 8 – Rail and Light Rail Transit

- Diagnostic team involved with any changes with highway rail crossings.



MUTCD 11th Edition Updates

Part 8 – Rail and Light Rail Transit

- Word Message/Exclusion Signage

MUTCD 11th Edition Updates

Part 9 – Bicycles

- Significant material on bikeways, separate bike lanes, and other infrastructure elements. (maintenance heavy)

MUTCD 11th Edition Updates

Part 9 – Bicycles

- Except Bicycle Sign R3-7bP
- Addition of bike lane to R3-8 Lane Assignment Signs
- **Back-in-parking sign R7-10**
- **Bicycle Passing Clearance Sign R4-19**

MUTCD 11th Edition Updates

Part 9 – Bicycles

- Bicycle Use Shoulder Only Sign R9-21
- Signs for Bicycles on Freeways
- Two-stage bicycle turn box signs (R9-23)
- Bicycle Jughandle Signs (R9-24, R9-25, R9-26 and R-27)

MUTCD 11th Edition Updates

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Updates and Changes

Bicycle Route Sign Crossing State Lines

M1-9

M1-9

Questions