The MUTCD: Where It’s Been and Where It’s Going

- 1930s
- 1920s
- 1940s
- Early 1950s
- Today

Gene Hawkins
Texas A&M University

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The MUTCD: Where It’s Been

There have been 9 editions of the MUTCD

## MUTCD Comparisons

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How did we end up with such a large document on traffic control devices?
Traffic Control Devices History

Early markers used in the Roman Empire
Used on pioneer trails in America
Automobile age created new demands

Roman Empire  Colonial America  Early 20th Century
Automobile Age
Early Intersection Control

Hand signals, police, and semaphores
Early Traffic Signals

Many different signal designs
Early Traffic Signs

Little coordination between agencies

© Gene Hawkins
Early Traffic Control Devices

The wide variety of devices created the need for uniformity.

1911 - 1st centerline Michigan

1914 - 1st electric signal Cleveland

1920 - 1st 3-color signal Detroit

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1923 Sign Shape Recommendations

Mississippi Valley Assoc of St Hwy Dept
Number of sides represents hazard level

- RR Grade Crossing
- Stop Intersection
- Warning (speed reduction)
- Caution
- Directions or Regulations

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1924 Sign Color Recommendations

National Conference on Street and Highway Safety

For signs and signals

- **Red** - stop
- **Green** - proceed
- **Yellow** - caution
- **White** - directions or distance
- **Purple** - intersection
1925 Joint Board Report

Report of Joint Board on Interstate Highways
AASHO led
Developed U.S. Highway system
Included recommendations for standard signs
1927 AASHO Manual

Evolved from Joint Board
First national manual
Rural signs only

Title:
Manual and Specifications for the Manufacture, Display, and Erection of U.S. Standard Road Markers and Signs

Revised 1929 and 1931
1927 Signs

Block letter font
1930 NCHS Manual

Prepared by American Engineering Council

Title: Manual on Street Traffic Signs, Signal and Markings

Not Revised
1930 Signs

- Speed Limit 20 Miles
- Through Traffic
- Caution School Zone
- Railroad Crossing
- Curves
Birth of the MUTCD

Problems of two manuals led to creation of the MUTCD

1927 Rural Manual

Joint Committee

1930 Urban Manual

1935 MUTCD

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First MUTCD (1935 & 1937 versions)

**Signs**
- White or yellow
- Diamond, square, circle, octagon

**Markings**
- White, yellow, or black

**Signals**
- 3-color signal as standard

Revised 1939
1942 MUTCD

Few major changes
Addressed wartime conditions
Conservation of materials
Blackout traffic control

Not Revised
Blackout Devices
1948 MUTCD

Significant rewrite

Signs

- Simplified messages
- Eliminated square signs
- Added advisory plate
- Rounded alphabet

Pavement markings

- Yellow - Double center & barrier line
- White - all other applications
- Edge lines not recommended

Simplified signal warrants

Revised 1954
1948 Signs

- Speed Limit 50
- Bryan
- Hearne 25
- Stop Ahead
- 35 M.P.H.
- Keep Right
Early Stop & Yield Signs
1954 Revision

Significant sign changes

**THRU**  
STOP HWY  
Became  
STOP  
YIELD  
RIGHT OF WAY

*Secondary messages eliminated*  
*New Sign*
Traffic Signal Legacies

Non-standard traffic signals continued in use through the 1950s and 1960s in some locations.

Darley 2 bulb signal

Wiley signal

NYC Olives
1958 AASHO Interstate Manual

Created for the new Interstate Highway system

New features

- White on green guide signs
- Lower case letters
- Green on white service signs

Utilized larger sign sizes

Blue service signs added in 1961 revision

New Interstate Signs

- Interstate 10
- Interstate 75
- Business Spur 56
- Metropolis Utopia
- Exit 30
- Rest Area 2 miles

© Gene Hawkins
Federal compliance required

New material:

Construction traffic control
Civil defense signing
Freeway guide signing

Not Revised
1961 Signs

- Yield sign
- Highway signs 56 and 14
- Sign indicating Metropolis Utopia
- Directional signs
- Texas Highway 81
- Evacuation route sign

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1971 MUTCD

Significant rewrite
DOT ownership
New features:
  Content: school areas
  Color: orange
  Shapes: pennant, pentagon
International sign influence
  Many new symbols
Yellow markings for opposing traffic

Revised 8 times

© Gene Hawkins
1971 Signs

- Yield
- Do Not Enter
- No Right Turn
- Road Construction Ahead
- Two Way Arrow
- Straight Ahead
- Pedestrian Crossing
- Slippery Road
- Stop Ahead
- No Passing Zone

© Gene Hawkins
1978 MUTCD

Update of 1971 edition
Loose leaf (binder) format
Individual page revisions
New content
RR-hwy grade crossings
Bicycle facilities
Yellow markings on left side

Revised 4 times
1978 Signs

- Center Lane Only
- Buses and 4 Rider Car Pools Only (6AM-9AM, Mon-Fri)
- Bike Route
- Construction ahead
- Stop sign
- Work zone
- Road closure

© Gene Hawkins
Update of 1978 edition
Included new revision (#5)
New content
Recreational/cultural signs
Logo signs
TODS
Planned to be revised only for safety reasons

Rev 3: Part VI
MUTCD During the 1990s

Blue ribbon panel (1989)
Recommended reformat and rewrite of 1988 MUTCD
Need to clarify intent (shall, should, may)
Recognition of language challenges
“shall be permitted” “may be justified”
“shall preferably be” “it is desirable that”
“normally should” “it is necessary that”
“may be required” “is intended for use”

Reformat/rewrite process started in early 1990s
Multiple proposed rules from mid- to late-1990s
MUTCD Rewrite Effort

First step
- Evaluate current language
- Reformat all content
  - Classify as standard, guidance, option, support
  - (with headings)

Second step
- Rewrite reformatted language
- Update content
- Fix inconsistencies

Result: Millennium MUTCD

© Gene Hawkins
2000 MUTCD

Millennium edition
Reformatted/rewritten
First web edition
Final rule published without chance to review MUTCD in its entirety
Many editorial and technical shortcomings

1 Errata
1 Revision

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Significant Changes

New structure
Standard, Guidance, Option, Support
New parts added to MUTCD
Low Volume Roads
Highway-Light Rail Transit Grade Crossings
Islands part deleted
Definitions added
Primary units: metric
Selected Key Changes

- Legibility index = 40 ft/in
- Sign graphics not accurate
- Lane ending symbol (W4-2) dropped
- Crosswalk lines dropped from crossing signs
- New Yield Line
- In-road lights

Courtesy of S. Wainwright, Montgomery County

© Gene Hawkins
2003 MUTCD

Current edition (9th overall)
Update of 2000 MUTCD
Changes
  Editorial improvements
  Graphics corrected
  Minor technical corrections
  Some new material
Compressed text
  982 to 754 pages

2 Revisions

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Selected Key Changes

Some new/revised signs
New sign color
Pink for incident mgmt
Countdown ped signals
Metric sign changes
Accessibility in work zones

Revisions:
1: Pharmacy signing
2: Min sign retro

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2009? MUTCD

Federal Register NPA - January 2, 2008
Docket closed July 31, 2008
Proposed text/figures on MUTCD web site
Many proposed changes
  513 significant ones
  Other additional changes
Perspective on changes
  Fine tuning of TCD use
  More specific and detailed guidance
  More devices addressed
Final rule in 2009?
NCUTCD History

Joint Committee, 1932, 2 organizations

National Joint Committee, 1948, 5 organizations

National Advisory Committee, 1972, 10 organizations

National Committee, 1980, 17 organizations

NCUTCD history task force
Dick Luetich, chair
Charged with preparing a history of the JC/NJC/NAC/NCUTCD
1978 NAC Meeting (Scottsdale, AZ)

General Session
MUTCD: Where It’s Going

Future editions to be published at 5-8 year intervals
NCUTCD/FHWA drafts, NPA, Final Rule

What will MUTCD be like in 25 years?
Depends on what people want

NCUTCD initiating MUTCD Strategic Planning Effort
What is the MUTCD?
Book of standards or book of practices

Who is the MUTCD audience?
Traffic engineers, agencies, lawyers, public, elected officials, architects, private property owners, +++

What should be in the MUTCD?
TCD principles or traffic engineering practices

What is a traffic control device?
Sign, signal, marking, rumble strip, floodlight, roundabout, glare screen, detectable warning, ...
MUTCD Trends

National trend of less traffic engineering experience within agencies

MUTCD is encompassing more and more information

Broadening subject matter
Providing more detailed guidance
Desire to have important non-TCD guidelines because everyone has the MUTCD (a one-stop document)

Desire to avoid litigation - more specific details in the MUTCD
Top Traffic Engr Publications

Posting to ITE Traffic Engr listserve (Apr 04)

What are the top 3 TE documents?

19 responses

18 - MUTCD
11 - Green Book
10 - Highway Capacity Manual
6 - Trip Generation and TE Handbook
1 or 2 each - Assorted other publications

⇒ Everyone uses the MUTCD!
MUTCD Strategic Planning

Previous efforts to define an “MUTCD Vision”

Mid-1960s: sponsored by ITE
1998 meeting organized by FHWA
2005 meeting organized by FHWA

Current effort

NCUTCD MUTCD Strategic Planning Effort
“Town Hall” meeting on Friday
Future task force meetings
Goal: prepare a MUTCD vision and strategic plan to achieve the vision
Task force web page
  Google Gene Hawkins (CE Prof) and click MUTCD link

Initial questions on next slide
Strategic Planning Questions

What are the strengths and weaknesses of the MUTCD?
What are the opportunities and threats facing the MUTCD?
Who is the target audience of the MUTCD? Who are the MUTCD stakeholders?
What is the MUTCD supposed to be? (what is the goal of the MUTCD)
What should the MUTCD address? (what content should be included in the MUTCD)
How should the MUTCD be structured? (what is the best way to organize the content)
How often should the MUTCD be revised?
What is the best means of revising the MUTCD? (should it be revised as an entire document or should revisions address limited aspects?)
What issues should be considered in the development of a strategic plan for the MUTCD?
What is the proper balance between identifying good practices and mandatory/recommended practices?
Can the MUTCD be all things to all people?
What is a traffic control device?
If the MUTCD is defined as a book of principles/standards/guidelines for traffic control devices, should the MUTCD address topics that are not defined as a traffic control device?
Who should be responsible for maintaining the MUTCD?
Other issues as identified ...
Potential Outcome

Perhaps a multi-volume MUTCD

Volume 1: Administrative stuff
  Procedures, definitions

Volume 2: Devices
  Signs, signals, markings

Volume 3: Applications
  Work zones (TTC), schools, RR crossings

Volume 4: Practices
  Setting speed limits, signal timing, traffic calming
Evolution of the MUTCD: Early Standards for Traffic Control Devices

BY H. GENE HAWKINS, JR.

Seventy years ago, traffic control devices were a concern of relatively few individuals in the United States. Signs and markings were placed and maintained by auto clubs, local agencies, devices (MUTCD), which sets forth the basic principles that govern the design and use of traffic control devices. The MUTCD, first published in 1935, has always been one of the "bibles" of the traffic control world.

One day in the late 1960s, I was running through my parent's garage and came across a 1948 MUTCD that my father used when he was a Highway Traffic in the mid-1950s. While perusing that document, I found that stop signs were yellow, highway centerlines could be white, and it was an eye-opening experience that led me to begin collecting old traffic engineering books. In 1990, I was fortunate enough to get the national MUTCD from the Eno Foundation for Traffic Safety. These documents provided great insight into how our current system of traffic control devices has evolved over several generations, insight which I felt was largely lost to our current generation of traffic engineers. Armed with these documents, I then researched the history of the MUTCD, the paper appearing in the Compendium of Technical Papers for the 1991 ITE Annual Meeting. The response to this paper and presentation were so positive, I prepared a series of papers on MUTCD history for ITE Journal. These papers were published in the Institute of Transportation Engineers. Gene Hawkins also prepared a description of the evolution of the use of paper marking color as part of MUTCD history.

Manual on Uniform Traffic Control Devices (MUTCD)

The Manual on Uniform Traffic Control Devices, or MUTCD, defines the standards used by road managers nationwide to install and maintain traffic control devices on streets and highways. The MUTCD is published by the Federal Highway Administration (FHWA), under Title 23 Code of Federal Regulations (CFR), Part 656, Subpart F.

The electronic version of the MUTCD 2009 Edition with revisions 1 and 2 incorporated is the most current edition of the MUTCD Irish site and is the official FHWA publication. FHWA is not printing copies of the MUTCD because of the prohibitive costs involved. The web site version is also more efficient and reliable when revising the MUTCD. National organizations have partnered and printed hard copies of the MUTCD. These hard copies are for sale, go to NHTSA, ITE, or ASPE to get sales information.

What's New

Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons

On July 16, 2006, the FHWA issued an Interim Approval for the Optional Use of Rectangular Rapid Flashing Beacons (RRFBs) as warning beacons supplementing pedestrian crossing or school crossing warning signs at crosswalks across uncontrolled approaches, under certain technical conditions. Experimentation with RRFBs in Florida and elsewhere found very high rates of motor vehicle yield to pedestrian compliance, mostly in the high 80s to close to 100 percent, versus only 15 to 20 percent for standard beacons. The very high yield rates are sustained even after 2 years in operation. For more information on the Interim Approval and how highway agencies can use RRFBs under the Interim Approval, see the Interim Approvals page in the Web site.

Proposed Amendments for Next Edition of the MUTCD

A Notice of Proposed Amendments (NPA) to the MUTCD containing comprehensive revisions proposed for incorporation into the next edition of the MUTCD was published in the Federal Register on January 2, 2008 for public review and comment. A 90-day period was provided for comments to be submitted, which closed on July 30, 2008. The NPA is currently being reviewed and analyzed the comments received, a final rule for the next edition of the MUTCD is anticipated during 2009. The NPA's proposed MUTCD level, figures, and tables are available for viewing. Slides presentations illustrating the proposed amendments are also available to enhance understanding.

Revision Notice 2.0 to the 2009 Edition of MUTCD

A final rule on signing retroreflectivity has been published in the Federal Register on December 23, 2007. This final rule adopts revisions to the current 2003 edition of the MUTCD. The revisions affect the MUTCD Interchange, Part 1, and Chapter 2A, plus minor editorial changes to cross-references in Chapters 2B and 3A. The set of revisions is revision number 2.0 to the 2003 edition of the MUTCD. The most current edition of the MUTCD is now the 2009 edition with revisions 1 and 2 incorporated.

The Federal Register notice of the final rule for revision number (2.0) can be viewed at: http://mutcd.fhwa.dot.gov/new-notices.htm

A document showing the specific changes to the MUTCD that are included in Revision No. 2.0 can be viewed at: HTML; PDF; PDF

For more information and background on Revision No. 1, please visit FHWA's signing retroreflectivity web site at http://signing.fhwa.dot.gov/
Signs Not in the 2003 MUTCD

DO NOT ENTER
ONLY
RAIL CROSSING
DO NOT ENTER
STOP ON RED
SLOW SCHOOL ZONE
EAST
INTERSTATE 20
DRIVE CAREFULLY
SUBSTANDARD ROADWAY