

History of the MUTCD



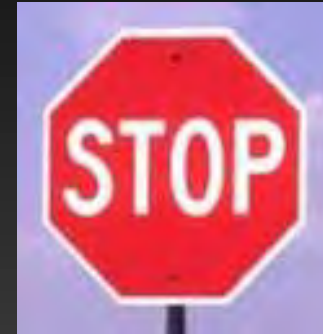
1920s



1940s



1950s



1960s



2000s



1930s

 **PennState**
College of Engineering

**TRANSPORTATION ENGINEERING
AND SAFETY CONFERENCE**

Gene Hawkins, PhD, PE
Senior Principal Engineer, Kittelson LLC
Professor Emeritus, Texas A&M University

Get phone
ready for QR
code

Gene Hawkins' Background

Expert witness with Kittelson LLC

Professor Emeritus, Texas A&M University Civil Engineering

Former researcher with Texas A&M Transportation Institute

Son of traffic engineer

Collector of historic traffic engineering documents

Presenting MUTCD history since 1991

Chair of NCUTCD



Old MUTCDs on KLLC MUTCD Website

Past Editions of the MUTCD

Interested in viewing or downloading a PDF version of a previous edition of the MUTCD? We are happy to offer downloads of all editions at no cost, but please fill out this form so we can stay in touch.

Click the links below to view PDFs of past editions of the MUTCD.

- [2003 MUTCD](#)
- [2000 MUTCD](#)
- [1988 MUTCD](#)
- [1978 MUTCD](#)
- [1971 MUTCD](#)
- [1961 MUTCD](#)
- [1948 MUTCD](#)
- [1942 MUTCD](#)
- [1935 MUTCD](#)



mutcd.kittelson.com

Significant Traffic Control Device Documents Related to the MUTCD

[1970 AASHO Manual for Signing and Pavement Marking of the National System of Interstate and Defense Highways](#)

[Download](#)

[1961 AASHO Manual for Signing and Pavement Marking of the National System of Interstate and Defense Highways](#)

[Download](#)

[1958 AASHO Manual for Signing and Pavement Marking of the National System of Interstate and Defense Highways \(Kittelson LLC gratefully acknowledges AASHTO for granting permission to share this copyrighted document\)](#)

[Download](#)

[1930 National Conference on Street and Highway Safety \(urban TCD manual\) \(Kittelson LLC gratefully acknowledges FHWA for providing the scan of this document\)](#)

[Download](#)

[1927 AASHO Manual and Specifications for the Manufacture, Display, and Erection of U.S. Standard Road Markers and Signs \(rural TCD manual\)](#)

[Download](#)

[1925 Joint Board Report on Interstate Highways \(Link coming soon!\)](#)

Documents Providing MUTCD History

[Evolution of the MUTCD: Part 1 - Early Standards for Traffic Control Devices, © Institute of Transportation Engineers, July 1992. Used by permission.](#)

[Download](#)

[Evolution of the MUTCD: Part 2 - The Early Editions of the MUTCD, © Institute of Transportation Engineers, August 1992. Used by permission.](#)

[Download](#)

[Evolution of the MUTCD: Part 3 - The MUTCD Since World War II, © Institute of Transportation Engineers, November 1992. Used by permission.](#)

[Download](#)

[New Developments with the MUTCD, © Institute of Transportation Engineers, February 1994. Used by permission.](#)

[Download](#)

[Evolution of the U.S. Pavement Marking System, A brief description of the evolution of pavement marking color was prepared as part of NCHRP Project 4-28 assessing the feasibility of an all-white pavement marking system. A portion of this document was included as Appendix A in NCHRP Report 484.](#)

[Download](#)

["MUTCD: Past, Present, and Future" Presented by Gene Hawkins to the AASHTO Committee on Traffic Engineering, Columbus, OH, June 2019.](#)

[Download](#)

MUTCD Evolution

There have been 10 editions of the MUTCD



1935

1942

1948

1961

1971

1978

1988

2000

2003

2009

1st Gen
(Initial)

2nd Gen
(Transition)

3rd Gen
(Mature)

4th Gen
(Modern)

Traffic Control Devices History

Early markers were used in the Roman Empire

Also used on pioneer trails in America

Automobile age created new demands



Roman Empire



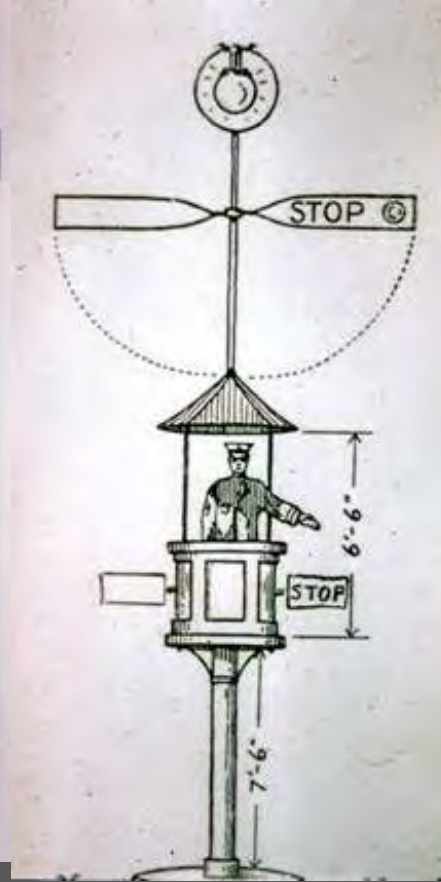
Colonial America



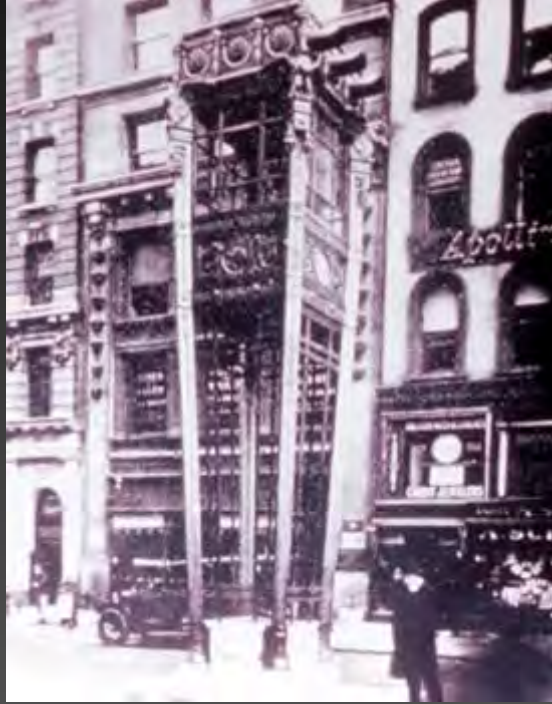
Early 20th Century

Early Intersection Control

Hand signals, police, and semaphores

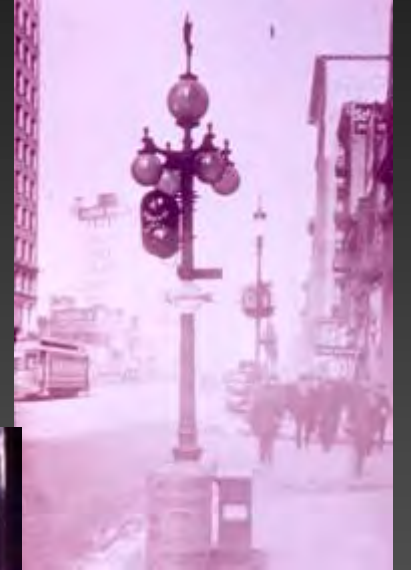


Traffic Signal Towers

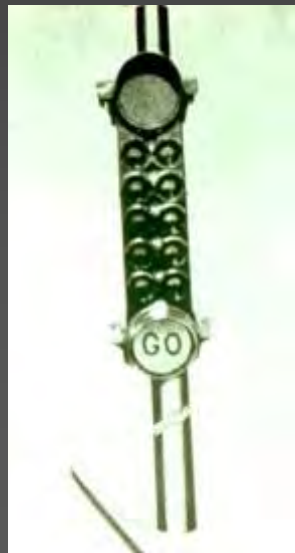


Early Traffic Signals

Many different signal designs

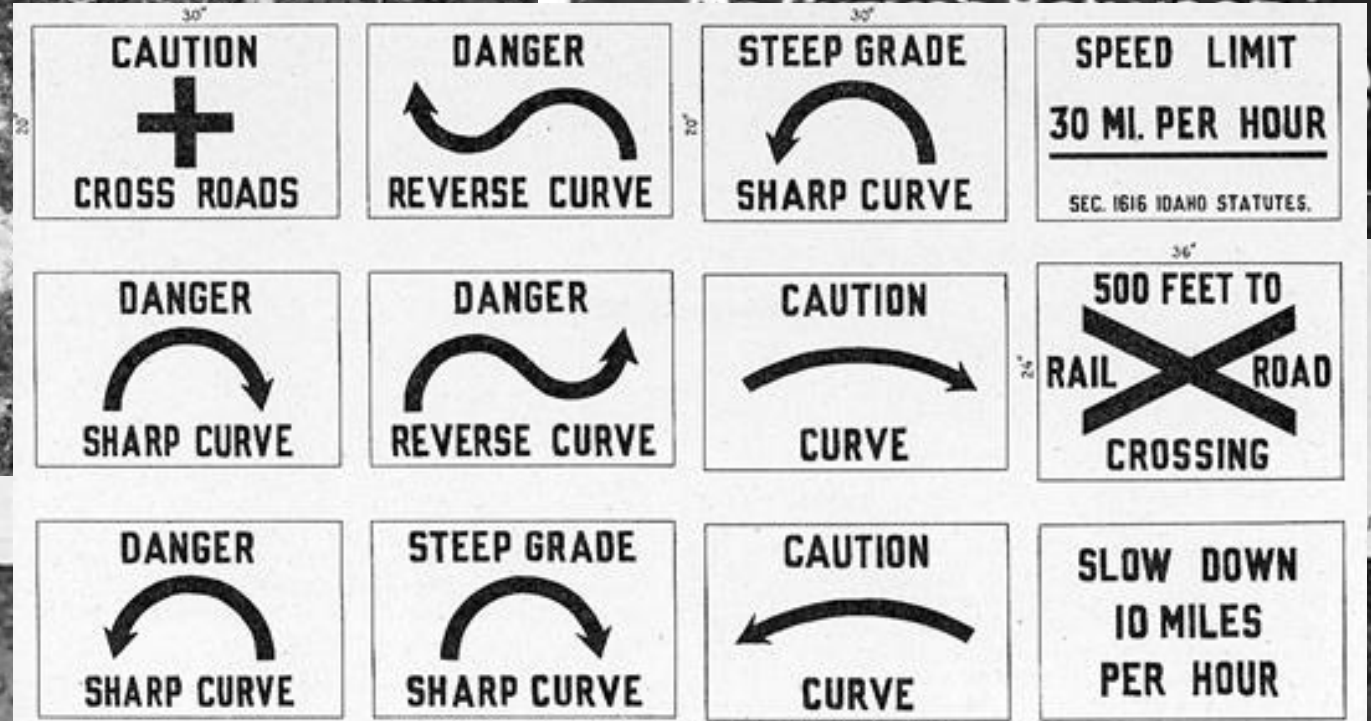


More Early Signals



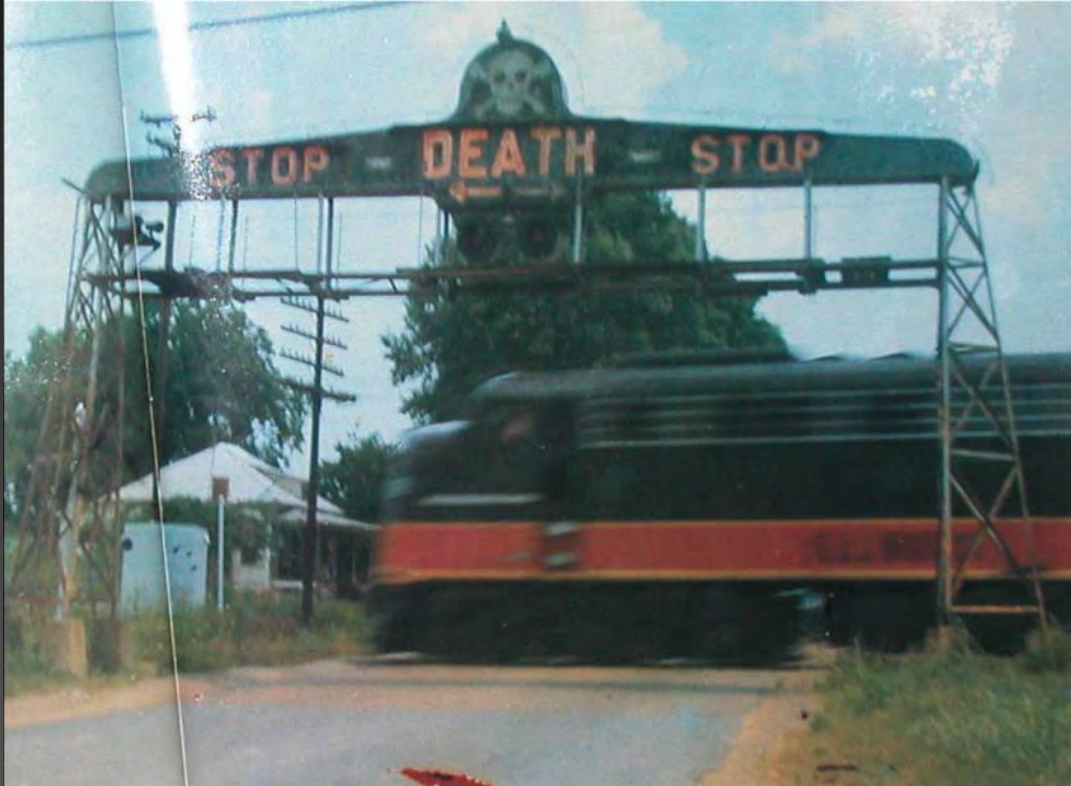
Early Traffic Signs

Need for devices increased with more automobile travel



Standard danger signs adopted by the Idaho Department of Public Works

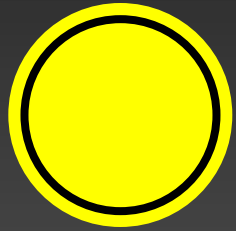
Early Grade Crossings



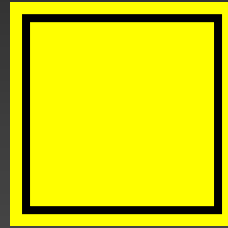
1923 Sign Shape Recommendations

Mississippi Valley Assoc of State Highway Departments

Number of sides represents hazard level



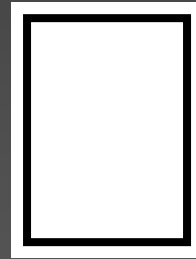
RR Grade Crossing



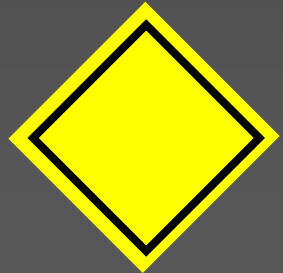
Caution



Stop Intersection



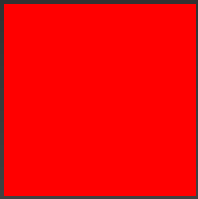
*Directions or
Regulations*



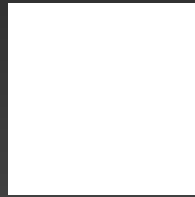
Warning (speed reduction)

1924 Sign Color Recommendations

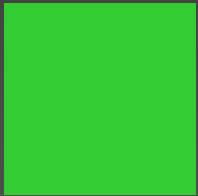
National Conference on Street and Highway Safety
For signs and signals



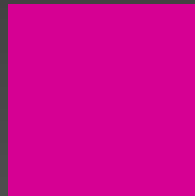
Red - stop



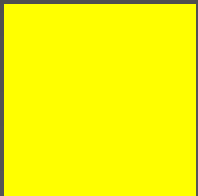
*White - directions
or distance*



Green - proceed



Purple - intersection



Yellow - caution

1925 Joint Board Report

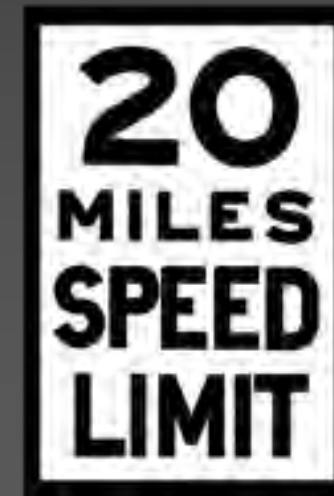
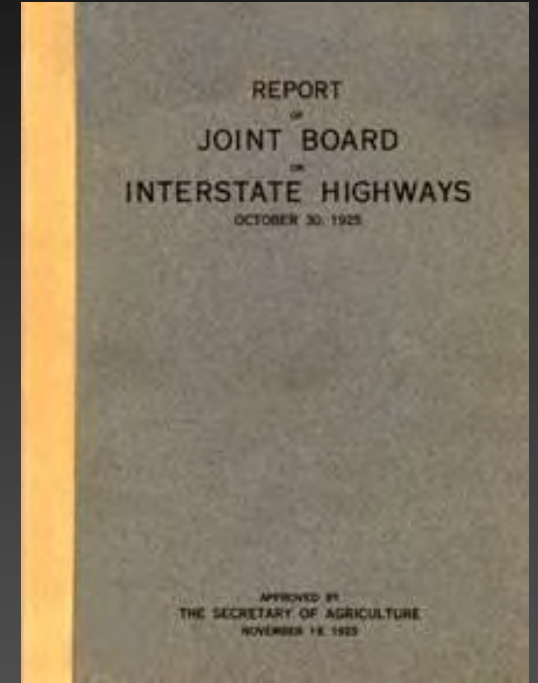
Report of Joint Board on Interstate Highways

AASHO led

Approved by Sec of Agriculture

Developed U.S. Highway system

Included recommendations for standard signs



1927 AASHO Manual

Evolved from Joint Board report

Published by American Association of
State Highway Officials

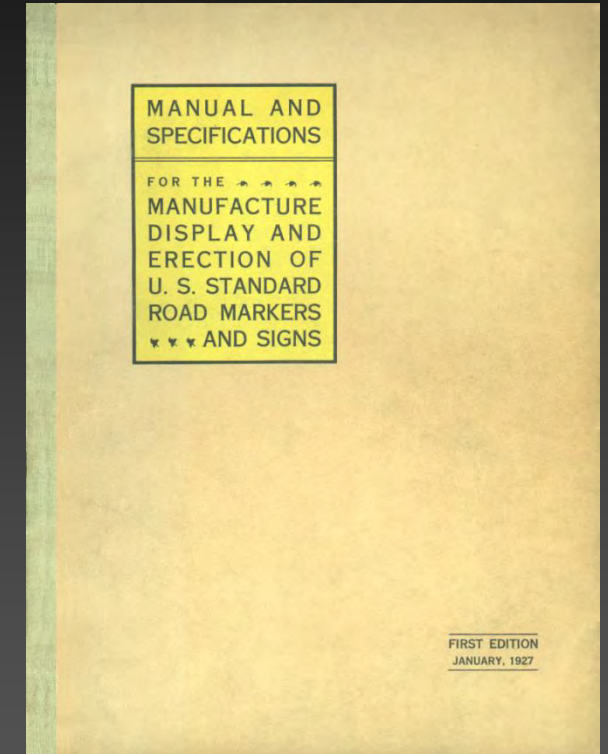
First national manual

Rural signs only

Signs were 24 inches

Title:

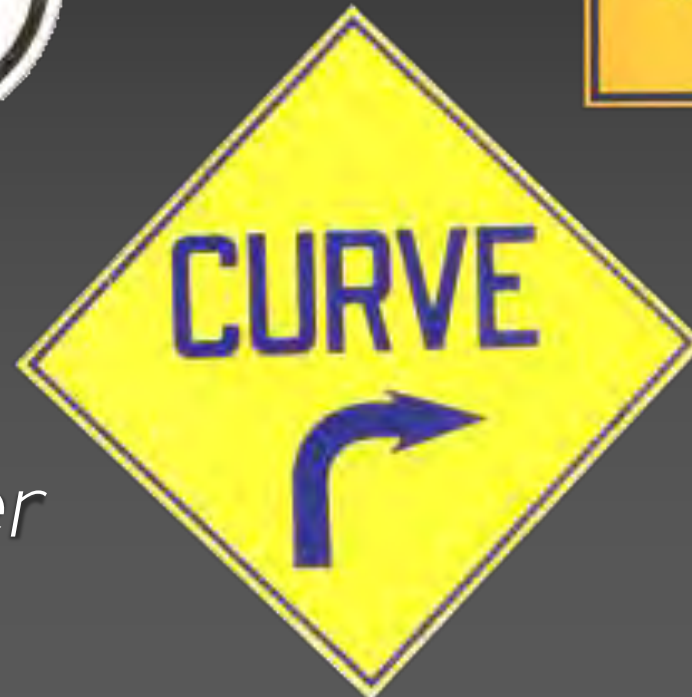
*Manual and Specifications for the Manufacture,
Display, and Erection of U.S. Standard
Road Markers and Signs*



Revised 1929
and 1931

➔ Available at
MUTCD.Kittelson.com

1927 AASHO Manual Signs

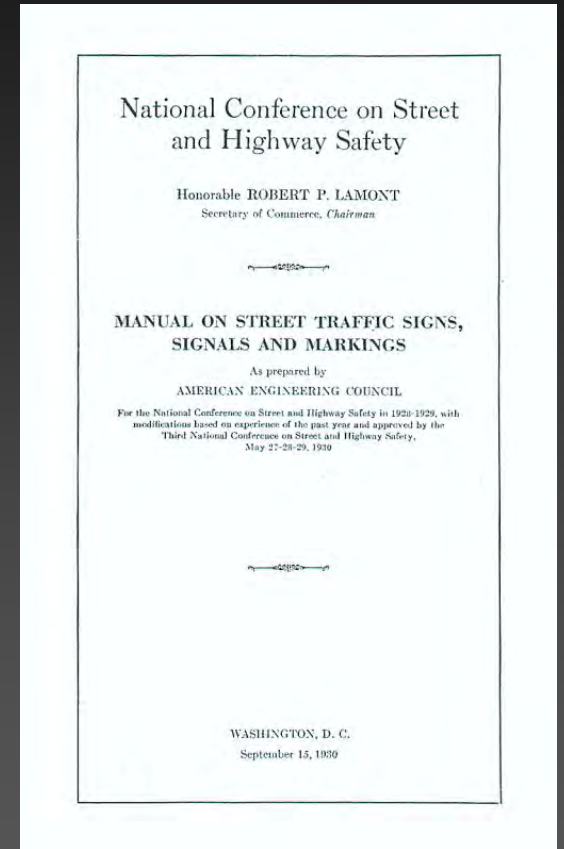


*Block letter
font*

1930 NCSHS Manual

Prepared by American Engineering Council
Signs, markings, and signals for urban areas
Title:

*Manual on Street Traffic Signs,
Signals and Markings*



Not Revised

➔ Available at
MUTCD.Kittelson.com

1930 NCSHS Manual Signs

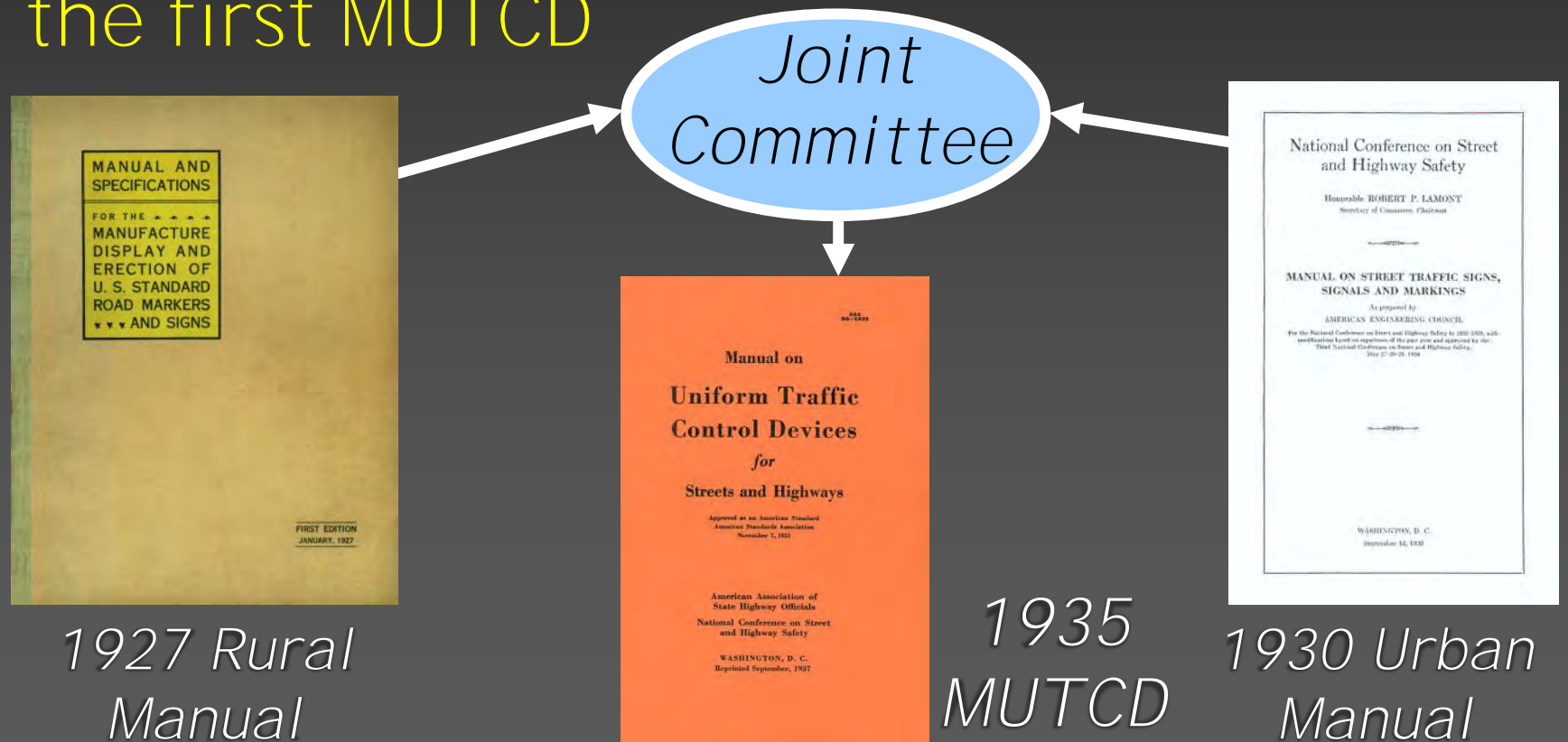


Birth of the MUTCD

Problems with two competing manuals

Led to creation of the Joint Committee on Uniform Traffic Control Devices in 1932

JCUTCD created the first MUTCD



1935 MUTCD

First MUTCD

1935 mimeograph

1937 typeset

Signs

White or yellow

*Diamond, square, circle,
octagon, rectangle*

Markings

White, yellow, or black

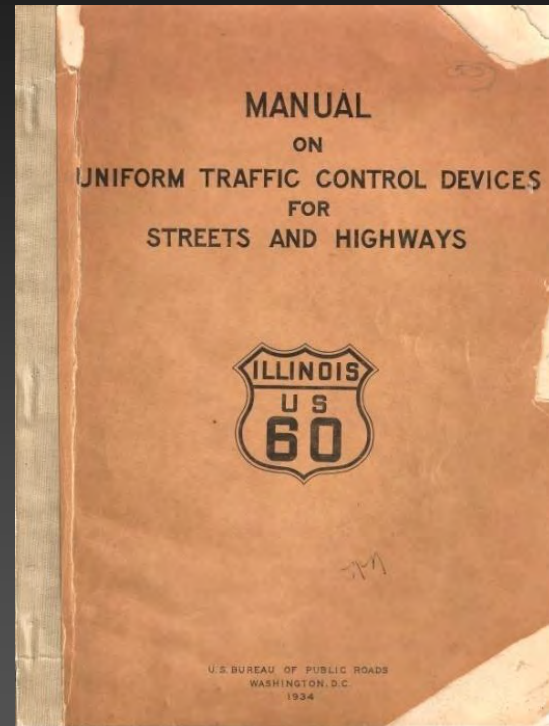
Signals

3-color signal as standard

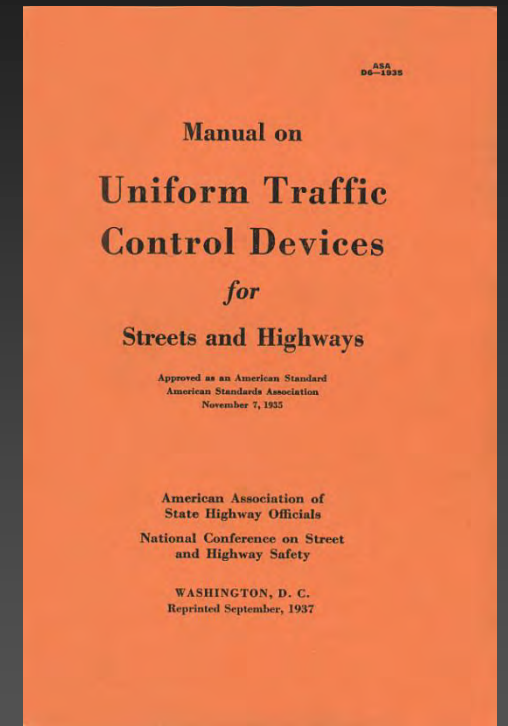
Approved as national standard

Published by JCUTCD, not a federal document

➔ *1937 version available at
MUTCD.Kittelson.com*

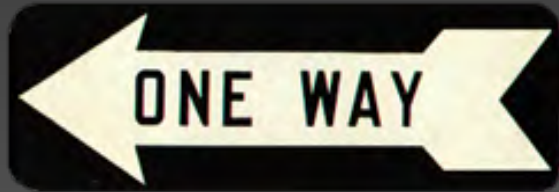


1935 Original



1937 Typeset
Revised 1939

1935 MUTCD Signs



1942 MUTCD

Few major changes

Addressed wartime conditions

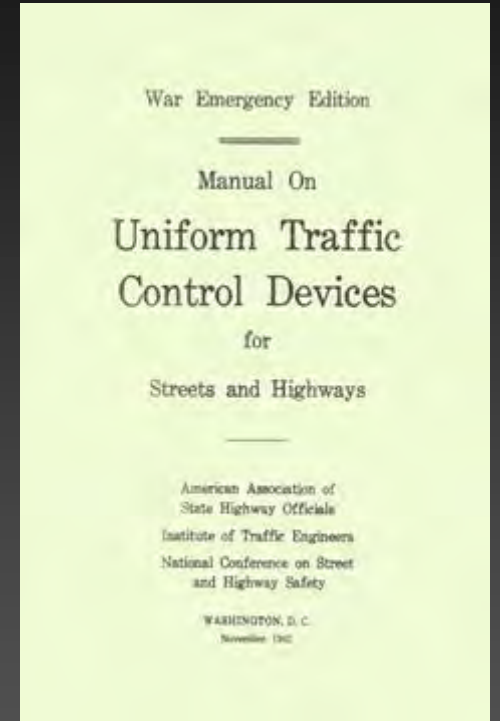
Conservation of materials

Blackout traffic control

ITE added to JCUTCD

Still no federal ownership

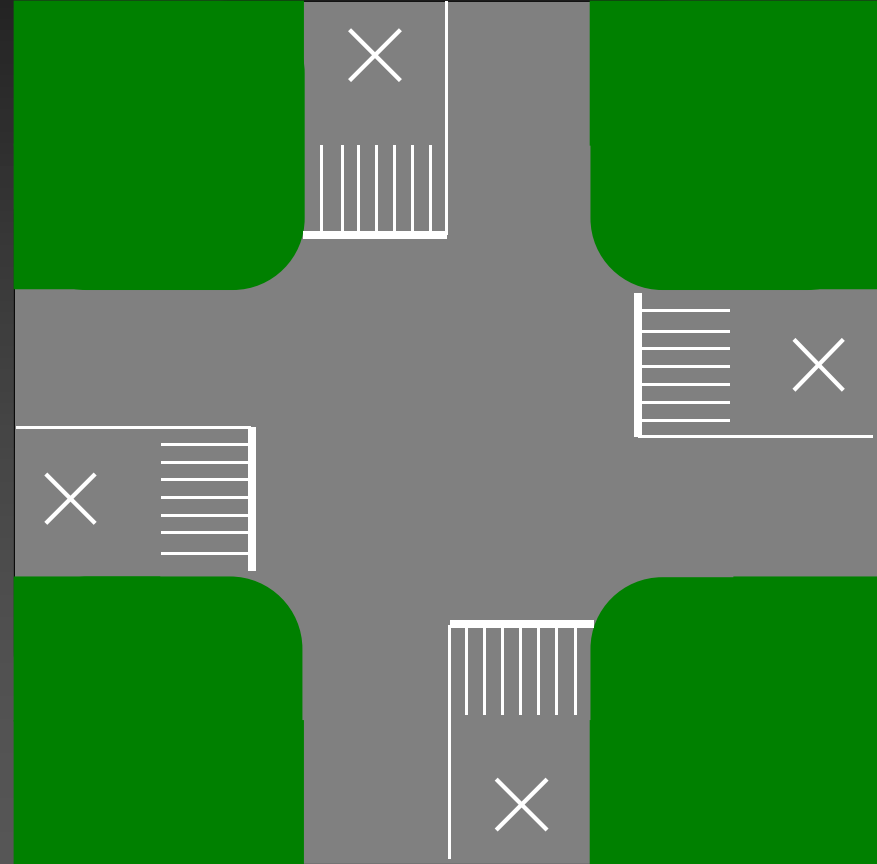
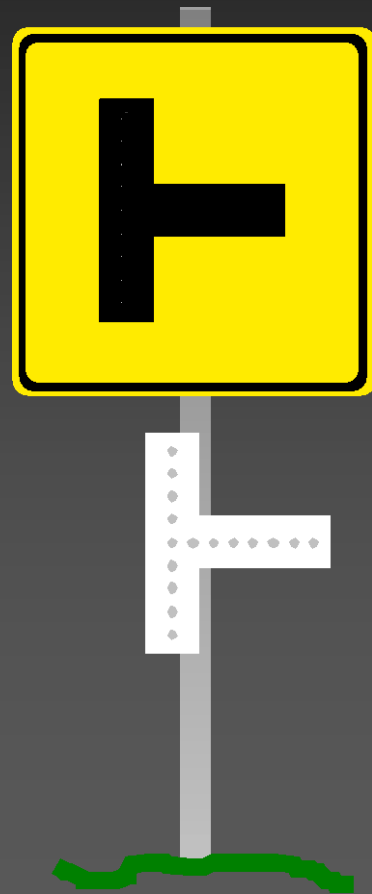
*War Dept and Civilian Defense
assisted in preparation*



Not Revised

➔ Available at
MUTCD.Kittelson.com

1942 MUTCD Blackout Devices



1948 MUTCD

Significant rewrite

Prepared by JCUTCD

Signs

Simplified messages

Eliminated square signs

Added advisory plate

Rounded alphabet

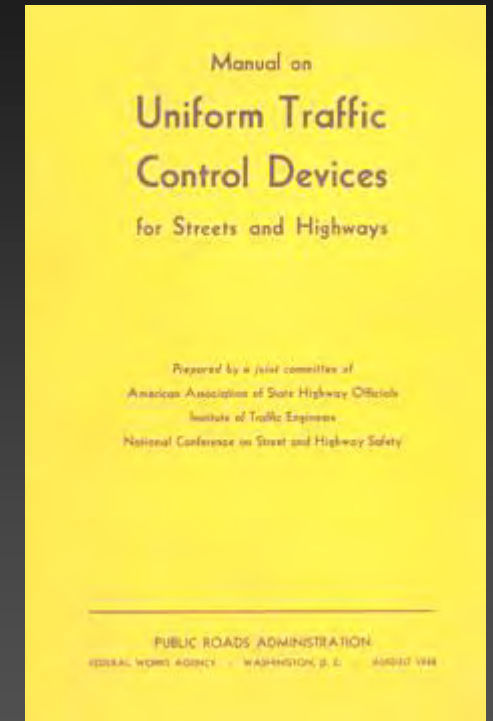
Pavement markings

Yellow - Double center & barrier line

White - all other applications

Edge lines not recommended

Simplified signal warrants



Revised 1954

➔ Available at
MUTCD.Kittelson.com

1948 MUTCD Signs



Early Stop & Yield Signs



1954 Revision

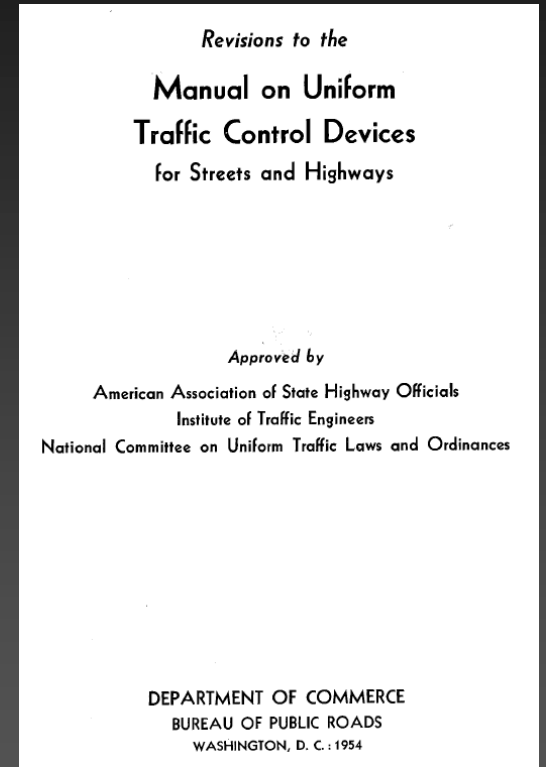
Significant sign changes



Secondary messages eliminated



New Sign



➔ Available at
MUTCD.Kittelson.com

Freeway Guide Sign Tests

New Interstate Highway system created signing and marking challenges

BPR research in mid-1950s

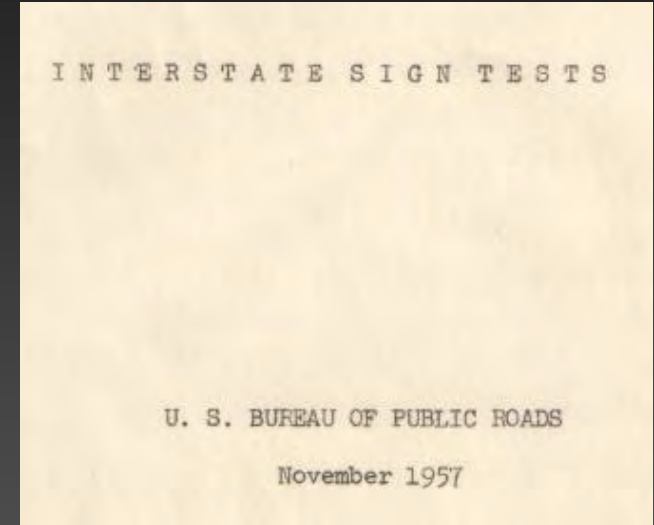
Evaluated freeway guide sign design

Black, blue, and green backgrounds

Lower case letters

Other new signs

Results lead to new signing guidelines



1958 AASHO Interstate Manual

Created for the new Interstate Highway system

Published by AASHO

New features

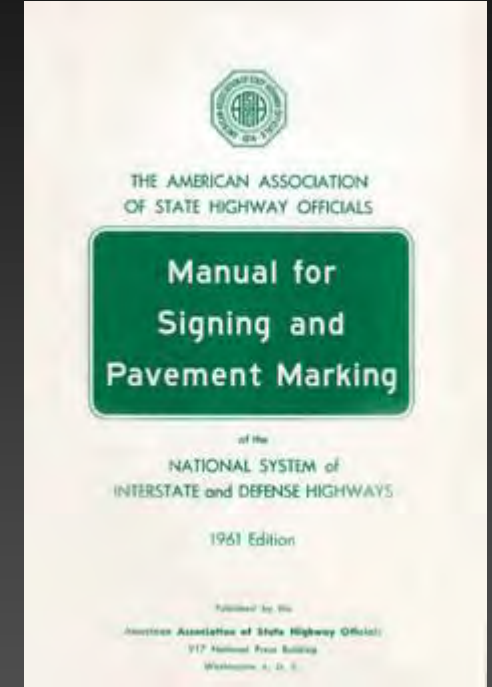
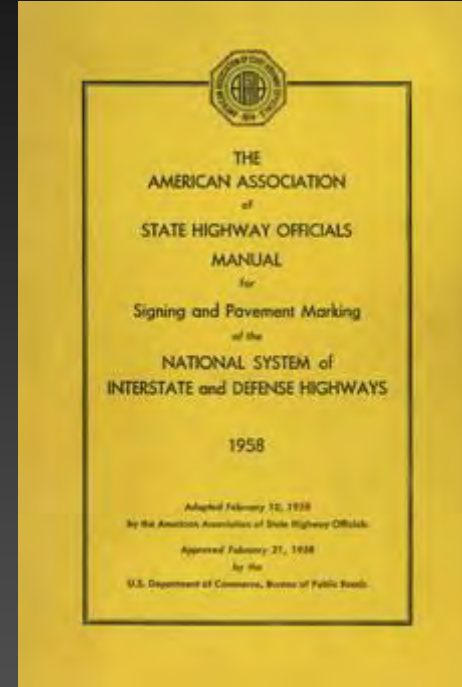
White on green guide signs

Lower case letters

Green on white service signs

Utilized larger sign sizes

Blue service signs added in 1961 revision



Revised 1961,
1962, 1970

➔ Available at
MUTCD.Kittelson.com

New Interstate Signs (1958 & 1961)



1961 MUTCD

Prepared by NJCUTCD

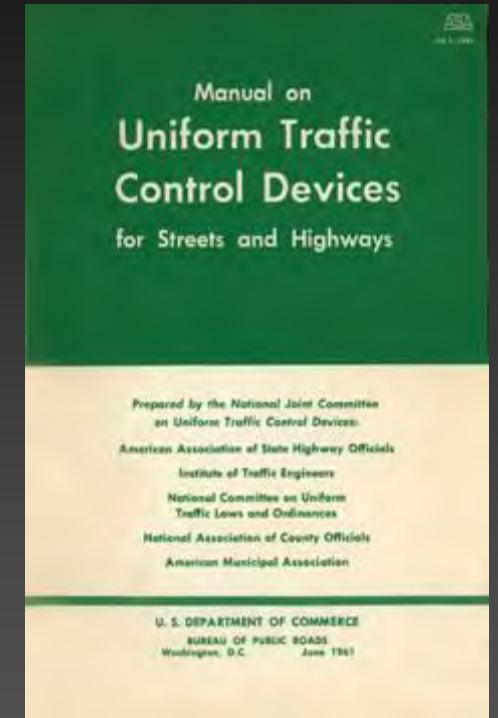
Compliance required for
federal aid roads

New material:

Construction traffic control

Civil defense signing

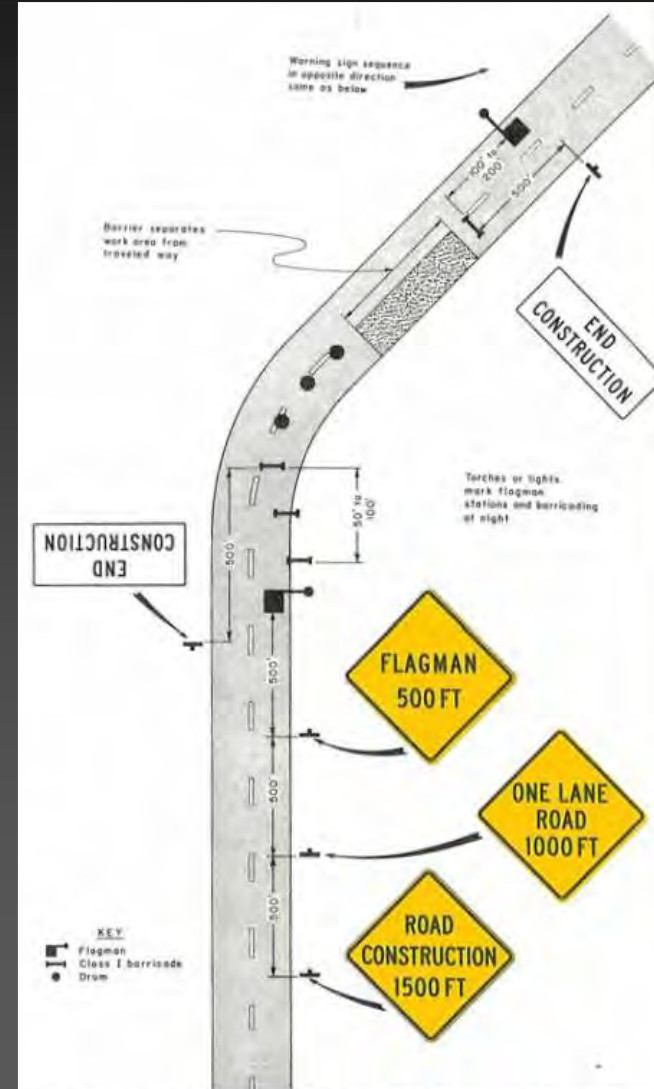
Freeway guide signing



Not Revised

➔ Available at
MUTCD.Kittelson.com

1961 MUTCD Signs



1971 MUTCD

Significant rewrite

Prepared by NJCUTCD

DOT ownership after publication

New features:

Content: school areas

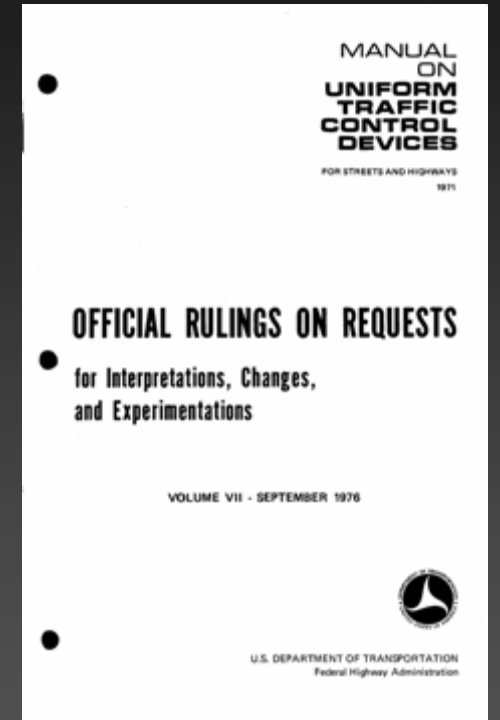
Color: orange

Shapes: pennant, pentagon

International sign influence

Many new symbols

Yellow markings for opposing traffic



Revised 8 times

➡ Available at
MUTCD.Kittelson.com

1971 MUTCD Signs



1978 MUTCD

Update of 1971 edition

Prepared by NACUTCD

Loose leaf (binder) format

Revisions provided replacement pages

New content

RR-hwy grade crossings

Bicycle facilities

Yellow markings on left side



Revised 4 times

➔ Available at
MUTCD.Kittelson.com

1978 MUTCD Signs



1988 MUTCD

Update of 1978 edition

Included new revision (#5)

Issued by FHWA by rulemaking

New content

Recreational/cultural signs

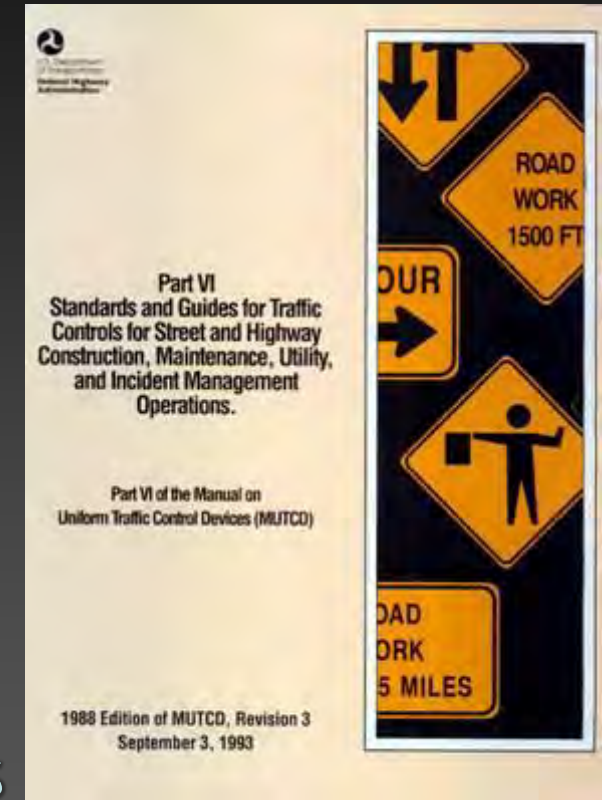
Logo signs

TODS

Planned to be revised only
for safety reasons



Revised 7 times



Rev 3: Part VI

➔ Available at
MUTCD.Kittelson.com

1988 Signs



MUTCD During the 1990s

Blue ribbon panel (1989), NCUTCD

Recognize shortcomings of 1988 MUTCD

Recommended reformat and rewrite of 1988 MUTCD

Need to clarify intent of language

Examples 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”

Two step process: reformat then rewrite

Rewrite/Reformat Effort

First step

Evaluate current language

Reformat language using shall, should, & may

Classify as standard, guidance, option, support (with headings)

Second step

Rewrite reformatted language

Update content

Fix inconsistencies

Multiple proposed rules in mid- to late-1990s

Resulted in 2000 MUTCD

2000 MUTCD

Millennium edition

Reformatted/rewritten

Significantly different
from 1988 MUTCD

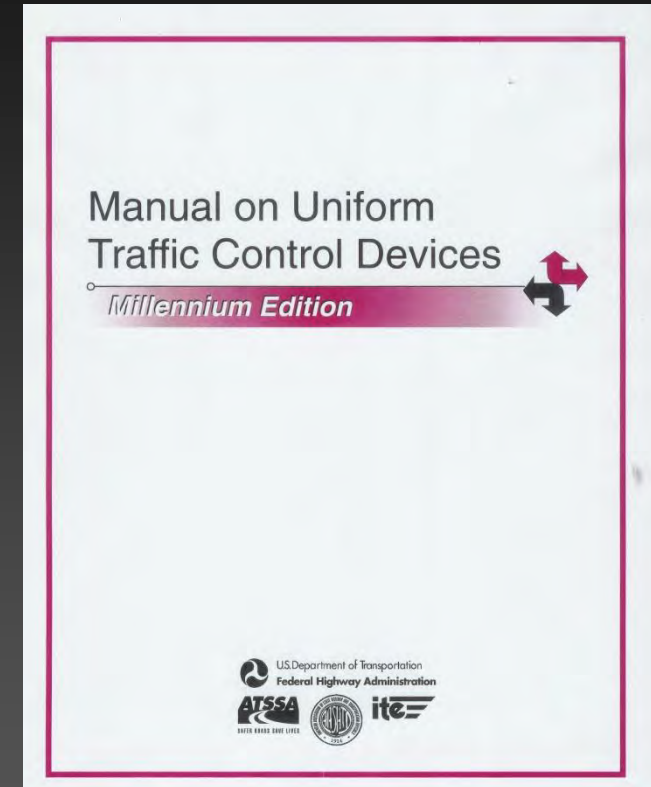
First with 8½x11 pages

First to be on the internet

Many errors & shortcomings

Editorial and technical errors

Errata did not correct all problems



1 Errata

1 Revision

➔ Available at
MUTCD.Kittelson.com

2000 MUTCD: 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



2000 MUTCD: 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

2003 MUTCD

Primarily an update of the 2000 MUTCD

Changes

Editorial improvements

Graphics corrected

Technical corrections

Some new material

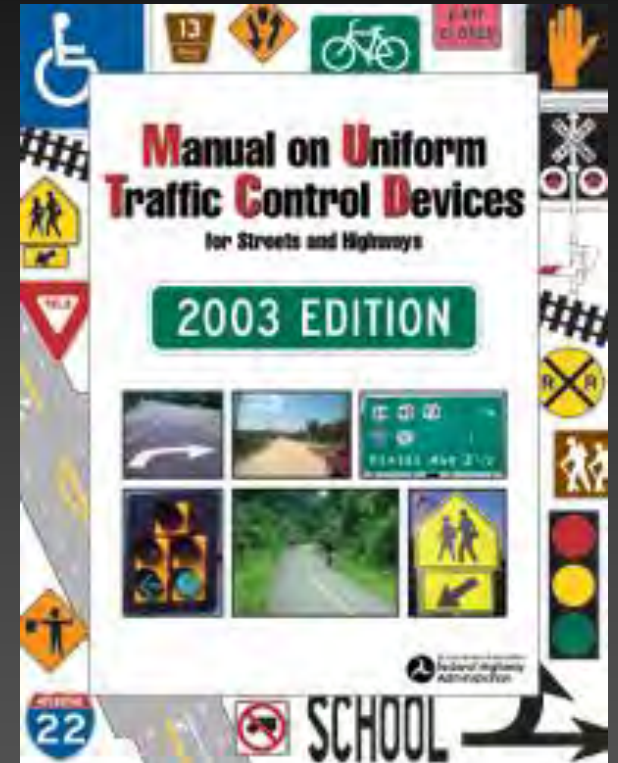
Compressed text

982 to 754 pages

Revisions:

1: Pharmacy signing

2: Minimum sign retroreflectivity



2 Revisions

➔ Available at
MUTCD.Kittelson.com

2003 MUTCD: Selected Key Changes

Some new/revised signs

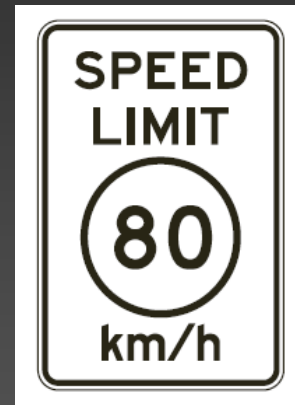
New sign color

Pink for incident mgmt

Countdown ped signals

Metric sign changes

Accessibility in work zones



2009 MUTCD

Current edition (10th overall)

Final rule: Dec 16, 2009

NPA received many comments

1,840 individual letters

15,000+ comments

Many changes

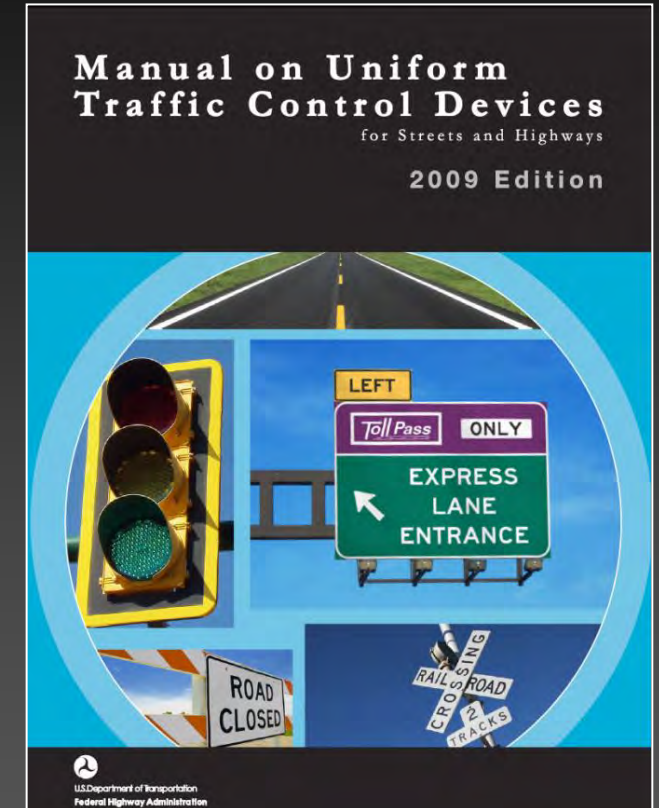
*611 significant changes listed
in Federal Register final rule*

Revisions:

1: Definition of standard/engineering discretion

2: Compliance dates

3: Minimum pavement marking retro



3 Revisions

➔ Available at
MUTCD.Kittelson.com

2009 MUTCD: Philosophical Changes

FWHA focus for 2009 MUTCD

Uniformity
Complete street concept: all road users
Aging population
Innovation

More specific detail, reduced ability to deviate

Fine tuning of TCD use
More devices addressed

Compliance dates restructured

Compliance as part of systematic upgrade

Combine RR and LRT parts

MUTCD applies to private property

New content

Toll road & managed lanes traffic control
Purple for toll roads
Changeable message signs



2009 MUTCD: Selected Key Changes

Paragraphs numbered, guidance italicized, metric values removed

Change in definition for a standard

Added: *“Standard statements shall not be modified or compromised based on engineering judgment or engineering study” [changed by Revision #1]*

Legibility index = 30 ft/in

Increases in sign sizes - 36 in Stop sign required for some situations

Increased requirements for One Way signs

Requirements for warning signs for changes in horizontal alignment

Revised optional lane guide signing
Arrow per lane sign

High-visibility safety apparel

Required for all workers within the public right-of-way

School warning signs: FYG only

Cannot use Speed Limit sign alone to end school speed limit zone

Yield or Stop signs required at passive grade crossings



2009 MUTCD: Signal Changes

12 inch indications for all new installations

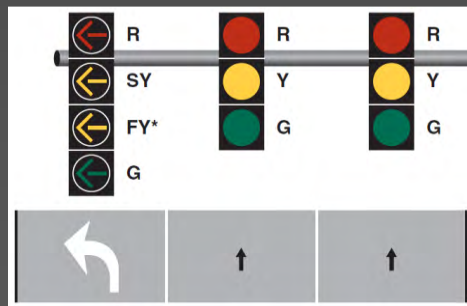
Limited use of 8 inch indications

Signal head for each lane when speed ≥ 45

Backplates required

Flashing yellow arrow for left turns

Hybrid beacon (HAWK) for ped crossing



11th Edition MUTCD (2023? MUTCD)

Notice of Proposed Amendments

December 14, 2020

*647 significant proposed changes
identified in Federal Register notice*

Docket comments

Over 17,000 submissions to docket

Over 35,000 unique comments on proposed changes

Status

*October 13, 2023: FHWA note on MUTCD website states
expectation to publish final rule (new MUTCD) in 2023*

Questions

