Manual on Uniform Traffic Control Devices (MUTCD)

Module: Introduction and Part 1

Presented by: Delaware T² Center
Delaware T² Center

- T² Centers or LTAPs located in all 50 states
- Funded by FHWA and state DOTs
- Mission – promote training, tech transfer, research implementation at local level
- Delaware T² hosted by University of Delaware, part of Delaware Center for Transportation
- Delaware T² funded by FHWA and DelDOT
The Preliminaries

Today’s Instructors:
• Dr. Earl “Rusty” Lee – T² Center Coordinator
• Matheu J. Carter, P.E. – Municipal Engineering Circuit Rider

Restrooms, etc.

Standard Reminders:
• Cell phones, pagers, beepers, walkie-talkies
• Sidebar conversations
More Preliminaries

- Questions – any time
- We’re a small crowd – let’s keep it interactive and informal
- Sharing of thoughts or examples – any time
- These slides will be posted on our website – see link on your notes
The T² Center MUTCD Program

What we cover directly:
- Introduction and Part 1 (General) – today’s module
- Part 2 (Signs)
- Part 3 (Markings)
- Part 6 (Temporary Traffic Control/Work Zones)

What we incorporate:
- Part 7 (School Areas)
- Part 9 (Bicycle Facilities)
The T^2 Center MUTCD Program

What we don’t cover:
- Part 4 (Traffic Signals)
- Part 5 (Low-Volume Roads)
- Part 8 (Railroad and Light Rail)

Why?:
- These modules are directed towards municipal gov’ts
- Part 4 – you probably don’t own signals
- Part 5 – their definition of low-volume roads excludes municipal streets
- Part 8 – you probably aren’t responsible for RRs or light rail

However
Go to the DE MUTCD website for training slides on the changes to Parts 2, 3, 4, 6, 7, 8, & 9
Acknowledgements

Primary references:
- Delaware MUTCD
- Federal MUTCD

Who we’ve shamelessly stolen from (with our thanks):
- DelDOT
- DelDOT’s consultants
- FHWA MUTCD website
- Numerous others

Good writers borrow from other writers; Great writers steal from them outright – Aaron Sorkin
In this module:

- A little bit of “MUTCD 101”
- A general overview of the “Parts”
- Details of the MUTCD Introduction and Part 1
- Some thoughts on regulatory liability and tort implications
- The meaning of “DelDOT maintained street”
- Retroreflectivity of signs and markings
- A focus on the Delaware MUTCD
Where Are You in the Game?

Show of hands – where do you fit in?

- I can’t spell MUTCD – I’ve never opened it
- I have a passing familiarity – but I’ve always thought it was out of my wheel house
- I’ve been told how to do things and I assume it’s based on the MUTCD
- I’ve read parts of it over time and applied it as I need
- I’m pretty fluent in the MUTCD
- I know the MUTCD – I could teach this course (careful, you’re now our “go to” person)
Where Are You in the Game?

Regardless of where are you now:

- We hope you’ll have a greater command when we’re done
- Don’t imagine this workshop will make you an expert (unless you already are one) – practice will do that
- As we go, share your challenges, experiences, and solutions – let’s all learn from each other

Ok – let’s get into it
• Federal MUTCD published in Dec. 2009

• DE MUTCD committee began meeting in Jan. 2010 to establish DE-specific guidance

• DE MUTCD submitted to Delaware Register for public comment in Spring 2011

• Except as noted, all presentation materials are the Delaware MUTCD June 2011
Where Do I Find the Delaware MUTCD?

DelDOT Website

http://deldot.gov/index.shtml
Where Do I Find the Delaware MUTCD?
Where Do I Find the Delaware MUTCD?

New Shortcut to this page

Notice there are other documents here too – complimentary guidance, memoranda, etc.

www.mutcd.deldot.gov
• Paragraphs are numbered
• No more metric
• Definitions relocated to Part 1
• Delaware Revisions in blue with line in margin and “(DE Revision)” at beginning of paragraph
• DE Standard: Reverted to 2003 MUTCD language allowing engineering judgment
  • More on this later

**Standards are bolded**

*Guidance is italicized*

• Options remain unformatted
How to Read the MUTCD

Throughout the MUTCD, each section will contain one or more of the following in some combination:

- **Standard** — “a statement of required, mandatory, or specifically prohibitive practice regarding a TCD” — these are “SHALLs”

- **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” — these are “SHOULDs”

- **Option** — “a statement of practice that is a permissive condition and carries no requirement or recommendation” — these are “MAYs”

- **Support** — “an informational statement that does not convey any degree of mandate, recommendation, authorization, prohibition, or enforceable condition”

Part 1; Section 1A.13
So?

So what?

- You won’t like some of the things the MUTCD tells you to do or how to do it or where to do it or that you can’t do it
- You will get frustrated
- You may want to throw it across the room – don’t, it’s too expensive and not bound very well
- Instead, know the differences between shall, should, and may
Does the MUTCD Apply to My Road?

- In all likelihood, yes
- If you can put a car, truck, bus, bike, segway, skateboard, or pedestrian on it and it’s open to the public, yes (¶01)
- “Private” property too
- Now, notice ¶03 C.
Where Doesn’t the MUTCD Apply?

- Generally, look to definition of Private Road Open to Public in 1A.13
- Unless you have a gated property where you restrict access at all times, you need to read the MUTCD
- The private sector commercial, industrial, retail, etc. folks need to understand this from a liability standpoint

158. Priority Control—a means by which the assignment of right-of-way is obtained or modified.
159. Private Road Open to Public Travel—private toll roads and roads (including any adjacent sidewalks that generally run parallel to the road) within shopping centers, airports, sports arenas, and other similar business and/or recreation facilities that are privately owned, but where the public is allowed to travel without access restrictions. Roads within private gated properties (except for gated toll roads) where access is restricted at all times, parking areas, driving aisles within parking areas, and private grade crossings shall not be included in this definition.
160. Protected Mode—a mode of traffic control signal operation in which left or right turns are
Does the MUTCD Apply to My Road?

- Yes
  - Circulation roads
- No
  - Parking Isles
- Still...MUTCD is best practice
Do I Have to Upgrade Immediately?

- Generally, no
- See Introduction
- Typically called “programmatic replacement”

But there are exceptions – see Table I-2 for compliance dates – we’ll talk about some of these in later modules.
Do I Have to Upgrade Immediately?

- Compliance table
- Programmatic change
- Tort liability

- Pending changes in Federal Rule...
- Stay on schedule

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**Table I-2. Target Compliance Dates Established by the FHWA (Sheet 1 of 3)**

<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>Minimum Retroreflectivity Levels</td>
<td>Implementation and continued use of an assessment or management method that is designed to maintain traffic sign retroreflectivity at or above the established minimum levels</td>
<td>January 22, 2012 (c)</td>
</tr>
<tr>
<td>2A.08</td>
<td>Minimum Retroreflectivity Levels</td>
<td>Replacement of regulatory, warning, and post-mounted guide (except street name) signs that are identified using the assessment or management method as failing to meet the established minimum levels</td>
<td>January 22, 2015 (c)</td>
</tr>
<tr>
<td>2A.08</td>
<td>Minimum Retroreflectivity Levels</td>
<td>Replacement of street name signs and overhead guide signs that are identified using the assessment or management method as failing to meet the established minimum levels.</td>
<td>January 22, 2018 (c)</td>
</tr>
<tr>
<td>2A.19</td>
<td>Lateral Offset</td>
<td>Crashworthiness of sign supports on roads with posted speed limit of 50 mph or higher</td>
<td>January 17, 2013 (a)</td>
</tr>
<tr>
<td>2B.03</td>
<td>Size of Regulatory Signs</td>
<td>Increased sign sizes and other 2003 MUTCD revisions to Table 2B-1 (*)</td>
<td>December 22, 2013 (b)</td>
</tr>
<tr>
<td>2B.09</td>
<td>YIELD Sign Application</td>
<td>Changes in YIELD sign application criteria from the 1988 MUTCD to the 2003</td>
<td>January 17, 2011 (a)</td>
</tr>
</tbody>
</table>
Do I Have to Upgrade Immediately?

Update

- Compliance table changed radically
- Used to be 3 pages
- This is it now
- Pressure’s off?
- Guess again
When is a TCD Needed?

Section 1A.02 guides us:

“To be effective, a traffic control device should meet five basic requirements:
A. Fulfill a need;
B. Command attention;
C. Convey a clear, simple meaning;
D. Command respect from road users; and
E. Give adequate time for proper response.”
Uniformity

- Drivers have seconds or less to see a TCD
- Peds and bikers too
- Urban environment – density of TCDs much higher
- Uniformity (size, color, shape, condition, even font) is key to fast recognition of the message

Section 1A.03 Design of Traffic Control Devices

Guidance:

- Devices should be designed so that features such as size, shape, color, composition, lighting or retroreflection, and contrast are combined to draw attention to the devices; that size, shape, color, and simplicity of message combine to produce a clear meaning; that legibility and size combine with placement to permit adequate time for response; and that uniformity, size, legibility, and reasonableness of the message combine to command respect.

- Aspects of a device’s standard design should be modified only if there is a demonstrated need.

Support:

Uniformity of the meaning of traffic control devices is vital to their effectiveness. The meanings ascribed to devices in this Manual are in general accord with the publications mentioned in Section 1A.11.
Uniformity, Placement, Maintenance

- Uniformity of the TCDs alone does not constitute conformity – how and where they are placed (and not placed) just as important
- Placement standards will be particularly examined in the Part 2 (signs) and Part 3 (markings) modules
- Maintenance
  - Retroreflectivity is key with signs and markings – more on that later
  - Even small amounts of graffiti, dirt, bullet holes or vegetative growth can greatly diminish the effectiveness of signs
Responsibility for TCDs

- The agency, corporation, or individual that “has jurisdiction”
  - State route – state DOT? Don’t assume; stay tuned
  - Municipal side street – municipal responsibility presumably
  - Bike path through a park – parks department presumably
  - Shopping center circulation road – mall owner presumably
  - If my agency “maintains the road” does that mean we’re responsible for the TCDs outside the curbs? More on that later under the topic “DelDOT maintained streets”

- “23 CFR 655.603 adopts the MUTCD 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)”
Guidance:

States should adopt Section 15-116 of the “Uniform Vehicle Code,” 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:

DE Revision) Delaware Code Title 17, Chapter 1, §147, requires the state of Delaware to “adopt a uniform standard for each type of traffic-control device to be used on all highways open to the public in this State.” Delaware has adopted the Delaware MUTCD and the Delaware Sign Book to fulfill this requirement. The Delaware MUTCD addresses adaptations of the Federal Highway Administration (FHWA) MUTCD to Delaware’s experience.

DE Revision) Delaware Code Title 17, Chapter 1, §147, prohibits anyone from selling or offering for sale any traffic control device that does not conform with the “state manual and specifications”.

DE Revision) Delaware Code Title 17, Chapter 1, §147, states that “any traffic control device erected in violation of [the Delaware MUTCD], except experimental devices erected by the Department, shall be unofficial, unauthorized and unenforceable.”

DE Revision) Delaware Code Title 17, Chapter 1, §134, states that on “state highways within their corporate limits, incorporated cities and towns in the State may erect and maintain such traffic control signals as shall be authorized by proper ordinance of the city or town and by the Department.”
Authority to Place TCDs

- If you/your agency/your company has jurisdiction over the road, you have the authority (and the responsibility) to determine what signs and markings do and don’t get installed or removed.
- State road within a town – typically a shared jurisdiction with the state and town.
- Advertisements and announcements within the right of way – only if you say so.
- Let the Delaware MUTCD be your guide – follow it and you should be okay.
When a TCD Isn’t

• Some signs and devices in the ROW are not TCDs.

• They can be there if you say so and if they fulfill a legitimate purpose.

• But they cannot be allowed to interfere with TCDs.

Part 1; Section 1A.08; ¶06 et seq.
Support:
01 Definitions of an engineering study and engineering judgment are contained in Section 1A.13.

Standard:
02 This Manual describes the application of traffic control devices, but shall not be a legal requirement for their installation.

Guidance:
02A (DE Revision) The decision to use a particular device at a particular location should be made on the basis of either an engineering study or the application of engineering judgment. Thus, while this Manual provides Standards, Guidance, and Options for design and application of traffic control devices, this Manual should not be considered a substitute for engineering judgment.
02B (DE Revision) Engineering judgment should be exercised in the selection and application of traffic control devices.
03 Early in the processes of location and design of roads and streets, engineers should coordinate such location and design with the design and placement of the traffic control devices to be used with such roads and streets.
04 Jurisdictions, or owners of private roads open to public travel, with responsibility for traffic control that do not have engineers on their staffs who are trained and/or experienced in traffic control devices should seek engineering assistance from others, such as the State transportation agency, their county, a nearby large city, or a traffic engineering consultant.

Support:
05 As part of the Federal-aid Program, each State is required to have a Local Technical Assistance Program (LTAP) and to provide technical assistance to local highway agencies. Requisite technical training in the application of the principles of the MUTCD is available from the State’s Local Technical Assistance Program for needed engineering guidance and assistance.
Part 1; Section 1A.09; ¶01 et seq.

Update – no longer a Delaware exception

Standard:
02 This Manual describes the application of traffic control devices, but shall not be a legal requirement for their installation.

Guidance:
03 The decision to use a particular device at a particular location should be made on the basis of either an engineering study or the application of engineering judgment. Thus, while this Manual provides Standards, Guidance, and Options for design and application of traffic control devices, this Manual should not be considered a substitute for engineering judgment. Engineering judgment should be exercised in the selection and application of traffic control devices, as well as in the location and design of roads and streets that the devices complement.

04 Early in the processes of location and design of roads and streets, engineers should coordinate such location and design with the design and placement of the traffic control devices to be used with such roads and streets.

05 Jurisdictions, or owners of private roads open to public travel, with responsibility for traffic control that do not have engineers on their staffs who are trained and/or experienced in traffic control devices should seek engineering assistance from others, such as the State transportation agency, their county, a nearby large city, or a traffic engineering consultant.

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06 As part of the Federal-aid Program, each State is required to have a Local Technical Assistance Program (LTAP) and to provide technical assistance to local highway agencies. Requisite technical training in the application of the principles of the MUTCD is available from the State’s Local Technical Assistance Program for needed engineering guidance and assistance.
MUTCD defines the difference

Notice that a study requires documentation, but judgment alone does not

64. Engineering Judgment—the evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. Engineering judgment shall be exercised by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. Documentation of engineering judgment is not required.

65. Engineering Study—the comprehensive analysis and evaluation of available pertinent information, and the application of appropriate principles, provisions, and practices as contained in this Manual and other sources, for the purpose of deciding upon the applicability, design, operation, or installation of a traffic control device. An engineering study shall be performed by an engineer, or by an individual working under the supervision of an engineer, through the application of procedures and criteria established by the engineer. An engineering study shall be documented.
Engineering
Judgment/Study

To practice engineering in Delaware, you have to be an Engineer.

Delaware Professional Engineers Act: https://dape.org/static/2009%20LAW.pdf
Interpretations, Experimentation, Changes

- Design, application, and placement of TCDs other than those adopted in the MUTCD prohibited
- Prohibited – plaintiff lawyers love that word
- You can ask for permission from FHWA to try something different, but DelDOT can tell you that’s a significant undertaking
Other Documents

- FHWA’s “Standard Highway Signs and Markings”
- Delaware Standard Signs Book – see DelDOT MUTCD page under “Part 2 Signs”
- Both are being updated

Part 1; Section 1A.11; ¶01
Other Documents

- AASHTO’s Roadside Design Guide
  - Clear zone
  - Breakaway and yielding anchors

There are many others listed in Section 1A.11

Part 1; Section 1A.11; ¶04
Colors

- Each one has identified purposes
- Improper use can undermine enforcement attempts

Support:
01 The following color code establishes general meanings for 11 colors of a total of 13 colors that have been identified as being appropriate for use in conveying traffic control information. Tolerance limits for each color are contained in 23 CFR Part 655, Appendix to Subpart F and are available at the Federal Highway Administration’s MUTCD website at http://mutcd.fhwa.dot.gov or by writing to the FHWA, Office of Safety Research and Development (HRD-T-301), 6300 Georgetown Pike, McLean, VA 22101.
02 The two colors for which general meanings have not yet been assigned are being reserved for future applications that will be determined only by FHWA after consultation with the States, the engineering community, and the general public. The meanings described in this Section are of a general nature. More specific assignments of colors are given in the individual Parts of this Manual relating to each class of devices.

Standard:
03 The general meaning of the 13 colors shall be as follows:
  A. Black—regulation
  B. Blue—road user services guidance, tourist information, and evacuation route
  C. Brown—recreational and cultural interest area guidance
  D. Coral—unassigned
  E. Fluorescent Pink—incident management
  F. Fluorescent Yellow-Green—pedestrian warning, bicycle warning, playground warning, school bus and school warning
  G. Green—indicated movements permitted, direction guidance
  H. Light Blue—unassigned
  I. Orange—temporary traffic control
  J. Purple—lanes restricted to use only by vehicles with registered electronic toll collection (ETC) accounts
  K. Red—stop or prohibition
  L. White—regulation
  M. Yellow—warning
Definitions and Acronyms

- These used to be scattered throughout the MUTCD
- They are now centralized in Part 1
- 259 Definitions
- 43 Acronyms
Section 1A.15 lists abbreviations
- Acceptable
- Unacceptable
- Specific to Portable Changeable Message Signs
- How and when to abbreviate

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Intended Word</th>
<th>Common Misinterpretation</th>
</tr>
</thead>
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<tr>
<td>ACC</td>
<td>Accident</td>
<td>Access (Road)</td>
</tr>
<tr>
<td>CLRS</td>
<td>Clears</td>
<td>Colors</td>
</tr>
<tr>
<td>DLY</td>
<td>Delay</td>
<td>Daily</td>
</tr>
<tr>
<td>FDR</td>
<td>Feeder</td>
<td>Federal</td>
</tr>
<tr>
<td>L</td>
<td>Left</td>
<td>Lane (Merge)</td>
</tr>
<tr>
<td>LT</td>
<td>Light (Traffic)</td>
<td>Left</td>
</tr>
<tr>
<td>PARK</td>
<td>Parking</td>
<td>Park</td>
</tr>
<tr>
<td>POLL</td>
<td>Pollution (Index)</td>
<td>Poll</td>
</tr>
<tr>
<td>RED</td>
<td>Reduce</td>
<td>Red</td>
</tr>
<tr>
<td>STAD</td>
<td>Stadium</td>
<td>Standard</td>
</tr>
<tr>
<td>WRNG</td>
<td>Warning</td>
<td>Wrong</td>
</tr>
</tbody>
</table>
Delaware Rules of the Road

- Worth a browse once a year
  - Pedestrian rules
  - Bicycle rules
  - Skateboard rules
  - Scooter rules
  - Vehicle rules
  - Setting speed limits

http://delcode.delaware.gov/title21/c041/index.shtml
Delaware Rules of the Road

• Setting speed restrictions

TITLE 21
Motor Vehicles
Operation and Equipment
CHAPTER 41. RULES OF THE ROAD
Subchapter VIII. Speed Restrictions

§ 4160. General speed restrictions.
(a) No person shall drive a vehicle on a highway at a speed greater than is reasonable and prudent under the conditions and without having regard to the actual and potential hazards then existing. In every event, avoid colliding with any person, vehicle or other conveyance on or entering the highway, or in compliance with legal requirements and the duty of all persons to due care.
(b) The driver of every vehicle shall, consistent with the requirements of subsection (a) of this section, drive at an appropriate speed when approaching and crossing an intersection or railway grade crossing, approaching a hill crest, when traveling upon any narrow or winding roadway and when a special hazard exists with respect to pedestrians or other traffic or by reason of weather or highway conditions.

§ 4169. Specific speed limits; penalty.
(a) Where no special hazard exists, the following speeds shall be lawful, but any speed in excess of such limits shall be absolute evidence that the speed is not reasonable or prudent and that it is unlawful:
   All types of vehicles:
   (1) 25 miles per hour in any business district;
   (2) 25 miles per hour in any residential district;
   (3) 20 miles per hour at all school zones where 20 mph regulatory signs are posted and state the time periods or conditions during which the speed limit is in effect; such conditions may include when children are and are not present at the school zone;
   (4) 50 miles per hour on 2-lane roadways;
   (5) 55 miles per hour on 4-lane roadways and on divided roadways.
(b) Whenever the Department of Transportation shall determine, on the basis of engineering studies and traffic investigations or upon the basis of a federal law or directive by the Congress or the President, that a maximum speed limit set pursuant to subsection (a) of this section at any particular place on the state maintained highway system is greater or less than is reasonable or safe, the Department shall declare a reasonable and safe maximum limit thereof, which limit shall be effective when posted. Such maximum limit may be declared to be effective either in part or all of the time and differing limits may be established for different times of the day, for different types of vehicles, for different weather conditions and when other significant factors differ. Such maximum limits may be posted on fixed or variable signs.
(c) Any speed in excess of such displayed limits shall be absolute evidence that the speed is not reasonable or prudent and that it is unlawful.
(d) Penalties for violation of this section are as follows:
   (1) Whoever violates this section shall for the first offense be fined $25. For each subsequent offense, the person shall be fined $25 or be imprisoned not less than 10 nor more than 30 days, or both. A subsequent violation, before being punishable as such, shall have been committed within 24 months after the commission of the prior offense.
   (2) Any person violating this section who exceeds the maximum speed limit by more than 5 miles per hour but less than 16 miles per hour shall pay an additional fine of $11 per mile, if such violation is a first offense, or $22 per mile, if such violation is a subsequent offense, for each mile in excess of the maximum speed limit.
   (3) Any person violating this section who exceeds the maximum speed limit by more than 16 miles per hour but less than 20 miles per hour shall pay an additional fine of $2 per mile, if such violation is a first offense, or $4 per mile, if such violation is a subsequent offense, for each mile in excess of the maximum speed limit.
   (4) Any person violating this section who exceeds the maximum speed limit by more than 20 miles per hour shall pay an additional fine of $3 per mile, if such violation is a first offense, or $6 per mile, if such violation is a subsequent offense, for each mile in excess of the maximum speed limit.
   (5) The Department of Transportation shall designate a maximum speed limit of 65 miles per hour for all portions of Delaware State Route 1 located between the Red Lion Creek and the Appoquinimink River. Such maximum limit may be posted on fixed or variable signs. Any speed in excess of such displayed limits shall be absolute evidence that the speed is not reasonable or prudent and that it is unlawful.
   (6) The Department of Transportation shall designate a maximum speed limit of 50 miles per hour for all portions of Delaware State Route 1 located between the Red Lion Creek and the Appoquinimink River. Such maximum limit may be posted on fixed or variable signs. Any speed in excess of such displayed limits shall be absolute evidence that the speed is not reasonable or prudent and that it is unlawful.

§ 4170. Speed limits set by local authorities.
(a) Whenever local authorities within their respective jurisdictions determine upon the basis of an engineering and traffic investigation that the absolute speed permitted under this chapter is greater than is reasonable or safe under the conditions found to exist, such local authority, subject to the subsection (c) of this section, shall determine and declare a reasonable and safe absolute speed limit, which shall be effective when appropriate signs giving notice thereof are erected.
(b) Local authorities in their respective jurisdictions may at their discretion, but subject to subsection (c) of this section, authorize by ordinance higher absolute speeds than those stated in this chapter upon through highways or upon highways or portions thereof where there are no intersections or between widely spaced intersections provided signs are erected giving notice of the authorized speed, but local authorities shall not modify or alter the basic rule set forth in subsection (a) of § 4168 of this title.
(c) Alteration of absolute limits on state-maintained highways in any municipality by local authorities shall not be effective until such alteration has been approved by the Department of Safety and Homeland Security.
Retroreflectivity

- This is just a teaser
- For details:
  - Part 2 (Signs) module
  - Part 3 (Markings) module
  - Retroreflectivity training
    - Basic Retroreflectivity
    - Retroreflectivity for Inspectors
- Retroreflectivity promises to be a real attractor for tort liability lawsuits
- Revised deadline – July 2011
  - Assessment or management method must be in place
Retroreflectivity

- Signs and pavement markings should all be retroreflective
- Most signs now have minimum quantitative retroreflectivity levels (Table 2A-3) that must be maintained
- Additional sign standards are coming
- Similar standards coming for pavement markings
“DelDOT Maintained Streets”

- Within municipal limits, this often means curb to curb only
  - Town Agreements
  - Project Agreements
- So, the sidewalks, the signage, etc. are typically your concern, despite what DelDOT may from time to time do
- How does this square with MUTCD 1A.07 – the agency, corporation, or individual that “has jurisdiction” is responsible for signage?
  - By virtue of whatever agreements may be in place and the practices that are generally accepted by DelDOT and the municipalities
Liabilities and Risk

- You can’t eliminate risk – but you can manage it
- Liabilities
  - Regulatory – while there are no “MUTCD Police,” you may find that you can’t get certain funding if your signs and markings are non-compliant
  - Constituents – your residents expect safe roads and they exact their frustrations through many avenues
  - Tort liability – signs and pavement markings are a cottage industry for plaintiffs’ attorneys
- Yes, you have many unmet transportation challenges, but you can’t afford to ignore this one
What is/are in the Other Modules?

- Part 2 (Signs) – ground based only
  - General (colors, dimensions, mountings, locations, retroreflectivity)
  - Regulatory signs, barricades, and gates
  - Warning signs and object markers
  - Guide signs for conventional roads (as opposed to freeways)
  - General information signs
  - Tourist-oriented directional signs
  - Changeable message signs
  - Emergency management signs
What is/are in the Other Modules?

- **Part 3 (Markings)**
  - General (colors, dimensions, materials, retro-reflectivity)
  - Pavement and curb markings
  - Delineators
  - Colored pavements
  - Channelizing devices
  - Islands
  - Rumble strip markings
What is/are in the Other Modules?

- **Part 6 (Temporary Traffic Controls)**
  - General and fundamental principals
  - TTC (aka, Work Zone) elements
  - Pedestrian and worker safety
  - Flagger control
  - Work zone devices
  - Types of work zone activities
  - Typical applications/cases
  - Incident management areas
Where Can I Find This Stuff?

- Delaware MUTCD: [www.mutcd.deldot.gov](http://www.mutcd.deldot.gov)
- Delaware T² Center: [http://www.ce.udel.edu/dct/T2.html](http://www.ce.udel.edu/dct/T2.html)
- These slides: [http://www.ce.udel.edu/dct/T2TechBriefs.html](http://www.ce.udel.edu/dct/T2TechBriefs.html)
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