FHWA Seeks Comments Regarding Proposed Reorganization of MUTCD

by Matt Cate, P.E.

The Federal Highway Administration issued a new notification and request for comment in the January 11, 2013, Federal Register. This notification specifically addresses a proposal to split the existing Manual on Uniform Traffic Control Devices (MUTCD) into two separate documents. One document, containing standards, guidance, and options essential to the design and application of traffic control devices (TCDs), would remain subject to the formal rulemaking process. The second document, containing typical applications and other supplemental information, would not be subject to the current rulemaking process. Interested parties may submit comments for consideration through March 12, 2013.

Over the years, the MUTCD has grown from approximately 150 pages in the original 1935 document to more than 850 pages in the revised 2009 Edition. This growth in the MUTCD has complicated the rulemaking process for FHWA and may make it difficult for many users to locate and interpret information within the Manual. The proposed changes are intended to result in “a simpler, streamlined MUTCD.” The current request for comments allows you to have a say in this potential transition.

The MUTCD itself would be reduced in size and scope to include standard statements, guidance statements that are critical to TCD design, application, or traffic safety, and option statements that provide exemptions to these standard and guidance statements. The second document, or Applications Supplement, would include recommendations and best practices while serving as a companion to the MUTCD. Content in this supplement could be expanded beyond the content of the current MUTCD to include additional information from other publications. Compliance with the material contained in the Applications Supplement...
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RoadTalk is a publication of the Tennessee Transportation Assistance Program (TTAP). TTAP is part of a nationwide Local Technical Assistance Program (LTAP) financed jointly by the Federal Highway Administration (FHWA) and Tennessee Department of Transportation (TDOT).

The views, opinions, and recommendations contained within this newsletter are those of the authors and do not necessarily reflect the views of FHWA and TDOT.

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As I write this, I’ve just returned from the Annual Meeting of the Transportation Research Board (TRB). This year, some 11,500 transportation professionals and students from throughout the world attended. It’s quite a production, and well worth taking in. I’ve been making the journey to TRB since 1979, and I never cease to be amazed.

The TRB meeting always attracts luminaries, and this year was no exception. I was privileged to hear presentations by several. The first was Transportation Secretary Ray LaHood, who was featured in a day long workshop on high-speed rail (HSR). The Secretary is obviously an HSR proponent, as is his boss, President Obama. He gave a thumping good speech praising the attributes of HSR and outlining a vision of connecting American cities by such systems. Secretary LaHood touted the Obama administration’s unprecedented support for HSR projects. The audience received these comments enthusiastically. Subsequent speakers echoed the general message.

I support rail as part of a balanced transportation system. However, I left this workshop thinking that there was a sad disconnect between the HSR vision and fiscal realities. While it is true that President Obama directed $10.1 billion towards HSR, much of this actually went for studies or small projects to aid conventional rail passenger services. The sad reality is that the amount allocated just isn’t sufficient to develop an actual HSR system, and thus far Congress has not authorized any additional funds. By world standards, the U.S. is a non-player in the HSR arena, and this isn’t likely to change soon. Consider that China will spend nearly $104 billion in railway vehicles and infrastructure in 2013 (a 30 percent increase from 2012). The Chinese already have nearly 5,800 route-miles of HSR in operation. The U.S. has no revenue stream to dedicate to HSR, and there is little probability that this will change soon.

On another front, I heard an interesting speech by retiring AASHTO Executive Director John Horsley. In keynote remarks at the TRB Chairman’s Luncheon, Mr. Horsley discussed the need for additional revenue to support the nation’s highway system. The Highway Trust Fund faces an impending “fiscal cliff”, with insolvency looming in late 2014. Unless addressed, the funding shortfall could reduce federal highway and transit investment by over 70 percent. Mr. Horsley proposes replacing the present motor fuel tax with a fuel sales tax. Properly structured, such a tax could provide $350 billion over the next six years compared with the $236 billion generated by the present excise tax. He projects an additional average cost to the highway user of one dollar per week per vehicle.

In these times of tax phobia, it is uncertain how Mr. Horsley’s proposal will be treated, but I think he has a good idea. Before we can ask citizens to dig deeper into their pockets, however, we

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need to make sure that every cent we need is justified. The perception of government waste is one factor inhibiting popular support for revenue issues. We are fortunate in Tennessee to have a culture of thrift and good stewardship of the public’s money. I hope we can keep it that way.

Well, that’s about it for this issue. As always, if we can help, please don’t hesitate to call or email. TTAP looks forward to assisting you. Be safe!

Daniel

MUTCD History Lesson

by Matt Cate, P.E.

Most of us probably remember several previous editions of the MUTCD. For me, my MUTCD memory begins with the long-obsolete 1988 Edition. The easiest way to look back on the complete history of the MUTCD and its origins is to visit a website maintained by Dr. Gene Hawkins, Associate Professor of Civil Engineering at Texas A&M University (https://ceprofs.civil.tamu.edu/ghawkins/MUTCD-History.htm). Dr. Hawkins’ site includes links to: articles and presentations on the history and evolution of the MUTCD, current MUTCD websites, and complete scanned copies of previous editions of the MUTCD (2003, 2000, 1988, 1978, 1971, 1961, 1948, 1942, and 1935) and its predecessors.

In some ways it is fascinating to see how much the MUTCD has changed over the years. On the other hand, much remains the same. A great example of this evolution can be found in the following excerpts from the original 1935 MUTCD, centering on its discussion of stop signs:

Section 106 – Stop Signs

A STOP sign shall be used only under the following conditions and then only where it is necessary that vehicles come to a stop before proceeding cautiously:

a) Where restricted view so requires.

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would be encouraged but not legally required.

There are currently two options for the division of current MUTCD. Under Option A, the MUTCD would retain all standard statements, important guidance statements, and all associated option statements. Support statements and stand-alone option statements would be moved to the new Applications Supplement. Option B would remove more information from the MUTCD, leaving only standard statements and option statements that contain exceptions to these standards. Under either option, the MUTCD and Applications Supplement would share a common organization and structure to make it easier for users to move from one document to the other.

FHWA has posed several specific questions regarding the proposed restructuring of the MUTCD. These questions are paraphrased below:

1. Do you support the plan to separate the MUTCD into two documents?
2. Should the sections in the new Applications Supplement have a one-to-one correlation to the sections of the MUTCD?
3. Do you prefer Option A or Option B?
4. How would these changes to the MUTCD affect your state?
5. Do you prefer the printed or the electronic version of the MUTCD?
6. Do you find the “hotlinks” in the electronic version of the MUTCD helpful or cumbersome?
7. If the MUTCD is split, should FHWA continue to update the Applications Supplement or should this responsibility be transferred to another group or organization?
8. Should the Applications Supplement be updated without seeking public comment? Why or why not?
9. Should FHWA consider additional options to split the MUTCD into smaller documents?

Complete details of this Notification and Request for Comment can be found in the January 11, 2013 Federal Register (Volume 78, Number 8) at http://www.regulations.gov/#/docketDetail;D=FHWA-2012-0118.
b) Intersection of two main highways.

c) Intersection of a secondary with a main highway.

d) End of roadway having no outlet.

e) Railroad grade crossing where a stop is required by law.

f) Approach to a drawbridge where a stop is required by law.

g) Unsignalled intersections in a signalized area.

Stop signs are classified separately from other regulatory signs and are given a distinctive shape, for the reason that violation of them is extremely hazardous. They also have the highest inconvenience factor. Therefore, they should be used only where warning signs would be inadequate. Use at less dangerous points fosters disregard of all STOP signs. Isolated STOP signs, as in a) above, should not be installed unless based on visibility and speed studies.

Whenever a main highway is protected by STOP signs a “through highway” regulation should be in force, and an “ending” sign should be installed at the end of the section so protected.

Section 127 – Materials

Rust-resisting metal should be used for permanent signs and is recommended for all signs, but wood may be used for large signs and also for temporary and seasonal signs, and heavy cardboard may be used for special occasions or emergencies. For all signs the material specifications (see Appendix B) proposed by the Joint Board on Interstate Highways, the U.S. Bureau of Public Roads, the American Association of State Highway Officials, and the National Bureau of Standards should be used.

Non-corrosive bolts, screws and washers should be used for attaching signs to their supports to avoid discoloration.

Section 133 – Illumination

All STOP, slow-type and railroad advance warning signs shall be illuminated at night so as to be visible from all distances up to 350 feet. The outlines and word “STOP” of STOP signs, the outlines of slow-type signs and the outlines and letters “R R” of railroad advance warning signs shall be illuminated.

Less brilliant illumination of the message on slow-type signs is desirable but optional. If a sign is necessary in daylight, it has greater value at night, inasmuch as night driving at high speeds is continually increasing. Illumination of the outline of STOP and slow-type signs will make them visible at ample distance to enable motorists to slow down in time to read and obey the specific message.

Illumination of word messages legible a sufficient distance would hardly be feasible. Illumination of the outlines, besides providing advance warning, should have much educational value in impressing upon motorists the significance of shapes.

In any program of replacement of existing equipment the first replacements with standard signs shall be at the most hazardous locations and at places where the signs are not otherwise adequately illuminated.

Section 134 – Method of Illumination

Illumination of signs shall be white, except the lettering on STOP signs, which shall be red. The following methods of illumination are listed in the order of preference:

a) A light, within or behind the sign, or luminous tubes, illuminating the outline of the sign and the main message, whether symbol or word. The light may be flashing or steady, preferably flashing.

b) An attached or independently mounted flood light focused on the face of the sign.

c) Reflecting elements set in the face of the sign.

Flashing or steady lights within the sign, flashing or constantly luminous tubes, or flood lights provide the maximum visibility under all conditions. Because of their higher cost and the difficulty of service connections, however, they will probably not be used very frequently in rural areas.

Reflecting buttons outlining the shape of a sign should be placed on the yellow background just inside of the black border.

The importance of the STOP sign is such that it merits a distinctive color of illumination, and red is so
generally recognized as a mark of danger requiring a vehicle to stop that it is the obvious choice for the purpose, especially as its visibility is adequate for permitted speeds.

Street lighting is not generally considered adequate illumination for signs because of inflexible location, reduced light due to foliage, and the fact that street lamps are sometimes not operated during all the hours of darkness.

Section 140 – Detailed Design of STOP Sign

The design and specifications of the standard STOP sign (Fig. 140) shall be as follows:

a) Shape.—Octagon, with two sides vertical.

b) Colors.—Yellow background, black or red letters and border; red reflecting buttons for word “STOP,” white for border.

c) Dimensions.—24 by 24 inches, or larger in multiples of 6 inches.

d) Main Message.—STOP, located in center.

e) Secondary Message.—Through Traffic, Bad Corner, Road End, Rail Road, or Draw Bridge, located above and below word “STOP.”

f) Letters.—“STOP” in 6-inch letters, Series E; secondary message in 3-inch letters, Series B.

The function of the secondary message is to give the reason for the stop and inform approaching motorists of what to expect.

Section 152 – STOP Signs

STOP signs at highway intersections shall be located at the crosswalk line or, in the absence of a crosswalk, not more than 30 feet from the intersected roadway.

STOP signs at railroad grade crossings shall be located 15 to 50 feet from the nearest track.

STOP signs at drawbridges shall be located exactly where it is desired that vehicles stop.

STOP signs at street ends shall be located in the center of the roadway at its end.

When possible, a STOP sign should be placed exactly where vehicles are expected to stop. At an intersection it should be as near thereto as possible without encroaching upon the crosswalk, so that operators can have a clear view of traffic approaching from both directions on the main thoroughfare. If, because of rounded curbs, the sign cannot be placed at this point, it should be placed at the end of the curb return and a stop line or marker installed at the stopping point. If curves in the highway reduce visibility, an advance warning sign reading “Stop Sign Ahead” should be used.

It is interesting to see that the MUTCD placed significant emphasis on the nighttime visibility of traffic control devices from the very beginning. That certainly places our current efforts to meet minimum retroreflectivity requirements in a new light (I had to say it). It is also interesting to see language warning against the overuse of signs. I’m sure that the members of the 1935 Joint Committee on Uniform Traffic Control Devices would be shocked and awed by the design and application of our modern traffic control devices.

Figure 140 from the 1935 MUTCD shows the sign described by Section 140 – a yellow octagonal sign with a black legend and red and white reflectors. The modern red STOP sign was adopted in the 1954 revision of the 1948 MUTCD.
Effective Regional Transportation Systems Management and Operations relies on a cooperative effort between an agency’s operation and planning department. While aspects of Planning for Operations are already occurring to some extent in many metropolitan areas and States, it is the intent of this US DOT program to instill greater importance, innovation, creativity, and sustainability into how these activities take place.

An effective transportation system requires not only the provision of highway and transit infrastructure for movement of the public and freight, but also the efficient and coordinated operation of the regional transportation network in order to improve system efficiency, reliability, and safety. Linking planning and operations involves actions that build stronger connections between transportation planners and operators. It involves coordination and collaboration that can reveal the role of operational strategies in helping to attain goals and objectives set forth in the planning process, and it integrates operations thinking in the planning of infrastructure projects.

Key outcomes of this linkage are:

- To instill “operations thinking” into the planning process – Planners have a greater understanding of the role of operations projects and programs in the context of meeting regional goals and objectives, and a greater understanding of how planners can help advance these activities.

- To instill “planning thinking” into management and operations – Operators have a greater understanding of how the long range planning process can support management and operations activities, and how these activities fit into the context of regional goals and objectives in the planning process.

The US DOT has developed a website (http://plan4operations.dot.gov/index.htm) intended to promote outreach, technical assistance, and professional capacity building to enable stakeholders to become aware and motivated to act.

Several publications are available as guidance for the Planning for Operations initiative:

- Operations Benefit/Cost Analysis Desk Reference;
- Creating an Effective Program to Advance Transportation System Management and Operations: Primer;
- Applying a Regional ITS Architecture to Support Planning for Operations: A Primer;
- The Role of Transportation Systems Management & Operations in Supporting Livability and Sustainability: A Primer.
In recent years, the City of Chattanooga has experienced steady increase in traffic demand leading to significant increase in delays and congestion. The advent of large companies made the city prosper but has challenged the existent transportation infrastructure. Looking into the future, the City of Chattanooga, TDOT, the regional planning agency, transit agencies plus counties and neighboring cities are coordinating to implement a regional intelligent transportation system (ITS).

Four hundred intersections will be ultimately upgraded and will operate under traffic-responsive and adaptive control features. Such advanced operations are dependent on reliable and robust communication systems, and that is exactly what stakeholders have prioritized with the deployment of a broadband wireless mesh network (WMN). The installation is quick, low cost, providing flexibility and wide Internet access coverage for fixed and mobile users of the system. Another advantage of WMNs is that it can be designed to simultaneously support multiple municipal applications, such as ITS, mobile public safety and city workforce, street lighting, automated utility meter reading, etc.

The City of Chattanooga has concurrently upgraded the traffic signal control equipment within the Central Business District and has those communicating to a brand new Traffic Operations Center located adjacent to the current traffic engineering offices. Mr. Jidong Yang, Mr. John Van Winkle and Mr. Stephen Meyer coordinated the project and point out some lessons learned in the process:

- Close coordination between different contractors (WMN and signal) is very important to identify and solve any system communication problems minimizing deployment time and traffic disruptions;
- Use of a standard operating procedure is recommended to clarify responsibilities of the traffic engineering department (operations and signal maintenance) and IT department (server maintenance for safety and security);
- Verification of consistency of signal timing operation after exchange of cabinet and controller equipment is needed;
- The need for adjustment of WMN to minimize interference from other Wi-Fi users; etc.

A more detailed article was published in the November 2012 issue of the ITE Journal (http://tsite.org/news-events/current-news-events/). On a recent visit to the City of Chattanooga’s traffic engineering department, Mr. John Van Winkle demonstrated the capabilities of the Traffic Operations Center and also informed that the project includes the installation of the Flashing Yellow Arrow display for permissive left turns in several intersections. It will be one of the first deployments of the Flashing Yellow Arrow in the state of Tennessee aiming to improve intersection safety and enhancing intersection operational capability.
We are always looking for your comments, ideas and suggestions to help make the TTAP Program more useful to you. Please fill out and fax the form below to TTAP at (865) 974-3889 or mail to TTAP; Suite 309 Conference Center Building, Knoxville, TN  37996-4133.

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