

Comments submitted to MUTCD Vision and Strategic Planning website in response to the white papers. These comments were submitted between June 21, 2012 and February 1, 2013. They are listed in reverse chronological order (most recent at the beginning).

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**Jeff Wolfe on February 1, 2013 at 2:26 pm said:**

Comments on White Paper #5:

As others have stated, we feel that splitting the manual may result in a more complicated/less understood document which could discourage use. The decision to modify the structure of the MUTCD should be based on more than just reduction/simplification of the rulemaking process. While rulemaking may be easier under some of the proposed alternatives, the overall process could be more complicated and/or time consuming. The primary concern should be whether the end-product is better. We have real concerns whether support structure would be available to effectively develop/maintain the MUTCD under some of the proposed formats. A suitable alternative may be strategic review and/or simplification of the MUTCD in its current format.

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**Jeff Wolfe on February 1, 2013 at 1:36 pm said:**

Comments on White Paper #6:

We agree with earlier comments made by Mr. Wainwright and the reference to the statement “is not traveling with an impairment” in line 63. In certain cases, traffic control devices are intended to provide information to those with an “impairment”.

In addition, the sentence in lines 61-65 defines “alert, attentive, and unimpaired road users” (note...should be “user” in the text). The definition mentions “a person who possesses the basic knowledge and capabilities necessary for travelling on the facility”. We are not sure what this phrase has to do with an “alert/attentive/unimpaired” road user. A road user could be alert/attentive/unimpaired but still not have the basic knowledge and capabilities to drive. This statement would appear to more consistent with the definition of a “reasonable and prudent road user” which is referenced in line 58. Likewise, we are not sure why there is a need to use both “alert” and “attentive” as those adjectives would appear to mean the same thing.

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**Tim Haagsma on January 22, 2013 at 12:55 pm said:**

I not sure reorganizing the MUTCD into multiple documents will do anything to improve Traffic Control Device uniformity, advance highway safety, speed the revision process, or simplify the use of the MUTCD. Having multiple documents could make the use of the MUTCD more cumbersome. Other options for reorganizing should be considered.

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**John E. Fisher on January 20, 2013 at 8:47 pm said:**

I agree with many of the comments, especially those submitted by Fred Ranck, Jim Pline, Tom Heydel, Scott Wainwright and Jonathan Upchurch.

White Paper # 1:

I do not agree with the purpose of the MUTCD as newly proposed, as it is too limiting. I strongly believe that the application, location/placement, operation, maintenance and removal of TCDs are valid purposes of the MUTCD. These aspects of TCDs are vital for promoting uniformity and improving traffic safety and therefore should be part of the “national standard”. The location of a sign (say a Curve Warning sign, for example) is important to ensure that motorists have sufficient time to respond. In addition, ensuring that there is a maintenance management plan to replace the sign when a threshold of retro-reflectivity has been lost is important so that motorists can adequately see the sign at night.

The primary problem with the proposed language is that it seems to be based on the premise that a “national standard” can only include “Standard” statements. If so, this is a semantics problem. Throughout its history, the MUTCD has served as a “national standard” and has always included “shall”, “should” and “may” statements. The “national standard” should be defined as encompassing “the limits and latitude regarding the appearance, meaning, application, location, placement, operation, maintenance and removal of TCDs.” In the MUTCD, the limits are shown as Standard statements, while the latitude is discussed as Guidance and Option statements. The MUTCD already allows flexibility and a range of acceptable practices to allow practitioners to customize the application of TCDs to a particular situation through the Guidance and Option statements. Where more flexibility is desired it can be vetted through the NCUTCD recommendation process and the FHWA rule-making process.

White Paper # 2

I believe that the proposed target audience is too narrow. If the target audience is limited to only professional traffic engineers with extensive experience, then the MUTCD would not be accessible to nor comprehended by those with less experience who aspire to master knowledge of the “national standard”.

Currently, there is a spectrum of users of the MUTCD. In large agencies there are dozens of relatively young transportation engineering staff who have been in the profession for only a short period after college. During their early years they rotate to various activities, some involving TCDs and other assignments not directly involving TCDs. When they rotate to a function involving TCDs they are referred to the MUTCD and are encouraged to seek guidance from those more experienced. They are expected to explain the appropriate application of TCDs to citizens, conduct citizen/elected official-initiated investigations, make proposals for improvements, conduct studies and prepare striping, signing and traffic signal plans for review and possible approval by licensed professional engineers. However, if they cannot adequately understand the MUTCD they cannot fulfill their expected supporting role in their agencies, nor would they be able, in time, to become expert in the application of TCDs.

Consider the needs of small agencies, where there is often only one or two persons who handle a variety of public works functions. In these agencies the application of TCDs might be only an ancillary function. While they might hire traffic engineering consultants for specific services,

they need to be sufficiently familiar with TCDs in order to fulfill their responsibilities and provide the appropriate oversight over consultants.

There are others who need to consult the MUTCD, as well, although not be as often as do experienced traffic engineers. Sub-professional aides and technicians are expected to handle matters regarding the application of parking signs, curb zones and school-related signs and sometimes need to consult the MUTCD. Maintenance personnel need to be familiar with some aspects of TCDs regarding the location and placement of them. Utility personnel need to refer to MUTCD Chapter 6H when they install temporary traffic controls. And transportation planners need to have some understanding of TCDs, as they make proposals regarding bikeway facilities and transportation plans.

The reality is that there is no single audience for the MUTCD. While the core audience may be those who have responsibility for TCDs, the term, “target audience” tends to be exclusive. The MUTCD needs to be written for an inclusive audience since a variety of users depends on it to one degree or another. In summary, the audience should be “all those who play a role in planning, designing, operating and maintaining TCDs.”

White paper # 3:

The MUTCD has not experienced a notable surge in the level of detail associated with traditional TCDs. Rather, the MUTCD has embraced many new TCDs and has addressed multi-modal needs for which new MUTCD provisions have been developed. Consider how technology has led to an increase in the types of TCDs, such as in-pavement warning lights, embedded lights on warning signs, blank-out symbol signs, etc Also, consider how the need to address other road users, such as older and handicapped pedestrians, bicyclists, light rail transit, toll and managed lanes, etc., has led to new provisions on how best to serve them. Naturally, the more technology and modes that are addressed the larger the MUTCD becomes. It would not be an option to avoid expansion of the MUTCD by ignoring advances in technology and enlightened thinking regarding multi-modal needs. Besides, the size of the MUTCD should not be a concern, since it is available in electronic format.

For the most part, I believe that the level of detail in the MUTCD is appropriate and not excessive, although there might be opportunities for technically expert and excellent writers to condense discussions, in some cases. The real question should not be the level of detail, but rather the level of rationale provided. If the MUTCD is to be used effectively by a spectrum of users, as I propose under my comments to White Paper # 2, there needs to be a greater effort to explain the underlying rationale for the Standard and Guidance statements. Some of those who perceive the MUTCD as too complex or prescriptive do so because they do not understand the underlying rationale behind some of the mandates. When the rationale is not understood, requirements are often perceived as onerous, burdensome or overly-prescriptive.

For example, one of the most complex areas of the MUTCD is that which describes the variety of displays associated with right-and left-turn signal phasing. Sections 4D-18 through 20 and 4D-22 through 24 contain mostly Standard statements but no support statements, whatsoever, to explain the underlying rationale and fundamental principles behind the requirements. A few additional well-written Support statements in these and many other sections would provide users with useful information to help them exercise judgement in applying the MUTCD.

## White Paper # 5:

Options for reorganizing the MUTCD should consider those other than having multiple documents. As many have already commented, splitting the MUTCD into two documents would not result in a reduction of content, since the whole would be equal to the sum of its parts. Having two documents would be cumbersome, since the user would have to navigate back-and-forth (whether electronically via links or manually via two books) to see the full context and content. I was a member of the California Traffic Control Devices Committee when, several years ago, California tried this by publishing both the MUTCD and a separate California Supplement. They abandoned this concept with the next edition of the MUTCD, due to the inconvenience of having to refer to two documents. Today, the California MUTCD is one document and shows special California provisions with a colored font. Another example of having a second document is the "Traffic Control Devices Handbook" that was originally published by the FHWA as a companion document to the MUTCD. After a short while, it no longer was a priority of the FHWA and was delegated to ITE for updating. However, the two documents have not been able to be updated concurrently, thus creating a disconnect with respect to coordination and uncertainty regarding its future. These experiences can foretell the consequences of having two MUTCD documents.

Other problems can be foreseen, as well. The secondary document might have secondary status and might not be officially "adopted" by the FHWA. As some sort of "informational" document it would be under a hanging cloud-of-uncertainty regarding its legal status. Without legal status and adoption by the FHWA, uniformity would suffer as states and other jurisdictions would tend to disregard provisions that are not part of the "national standard".

I sometimes am called upon as a tort liability expert for public agencies where the application of TCDs come into question. In evaluating the adequacy of the agencies application of TCDs, I find it helpful to point to the MUTCD as the ultimate source on the legal limits and latitude regarding their use. If an agency did not comply with a Standard or Guidance statement, I confidentially advise the public agency's legal counsel that there is vulnerability in their defense. On the other hand, if the expert witness for the plaintiff argues that a traffic signal should have been provided to prevent the contested collision but I can show that none of the guidelines for signal control were met that are based on years of experience, research, consensus by experts who advise the FHWA (the NCUTCD), and adoption by the FHWA, I can be credible and persuasive. If the FHWA were to abandon adopting parts of the MUTCD then there would be chaos in determining what due care should have been provided, since there would be no coherent "national standard". Without a clear, complete, coordinated and consolidated "national standard" that provides useful information on underlying principles (Support statements), that identifies the limits (Standard statements) and that shows the latitude (Guidance and Option statements) uniformity of TCDs would be compromised and traffic safety would suffer.

The real question, therefore, should not be restricted on how best the MUTCD should be divided, but rather how the MUTCD should be streamlined. There needs to be a focus on how best to streamline the MUTCD, so as to provide a better alternative to the FHWA than simply having two documents. Accordingly, I provide the following suggestions on how to streamline the MUTCD in terms of format and adoption:

1. As I commented in White Paper # 3, the MUTCD should be more accessible and understandable to its spectrum of users by having more and better-written Support statements to explain the underlying rationale and fundamental principles behind the requirements shown in the Standard and Guidance statements. When users can first understand the underlying

principles, they can then better grasp the details. This would go a long way in avoiding negative impressions of the MUTCD. A special, select group of persons within the FHWA and NCUTCD, who have a solid technical background and excellent writing skills should be drafted for this undertaking.

2. The amount of verbiage should be reduced by making greater use of summary figures and tables. Chapter 6H provides a good example of how typical application figures with some brief text can be used to convey requirements for the multitude of situations involving temporary traffic control. A good example of how a table can summarize the requirements, in this case for Curve Warning signs, is shown in Table 2C-5. An example of an opportunity to reduce the verbiage associated with specific regulatory signs would be to slightly modify Figures 2B-12 and 2B-14 through 18. Some of the verbiage associated with these figures could be reduced and some could be eliminated by having a simple verbiage statement, something like, “The RX-Y signs shall be provided as shown in Figure 2B-ZZ.” Figure 2B-ZZ would then have a notation next to each illustrated sign that would show “Optional”, “Recommended” or “Required”. The figure might also have a few notes to provide any further information that would be necessary.

Certainly, not all areas of the MUTCD lend themselves to graphical or tabular summaries, but there are many opportunities where this concept can be applied.

3. The adoption process should be simplified. The MUTCD should remain as a single document, where all content (Standard, Guidance, Option and Support statements, figures and tables) is adopted at one time by the FHWA. This is the only way to ensure that there remains a coherent “national standard” for uniformity of TCDs. Standard and Guidance statements and any Option statement, figures or tables that modify or complement them should continue to go through the conventional rule-making process, so that stakeholders have an opportunity to comment on important proposals that impact them. However, in order to simplify the adoption process, there should be no requirement for Option and Support statements to require public comment, since they would not mandate a requirement (Standard statement) nor set a recommendation (Guidance statement) that is normally expected to be followed, minus extenuating circumstances. The FHWA would therefore “adopt” the Option and Support statements (that do not require public review) at the same time that they adopt the Standard and Guidance statements that have gone through a rule-making process. There should be no controversy in having the discretionary application of TCDs being adopted by the FHWA without public comment, since the FHWA would still have the input of 300 expert volunteer members of the NCUTCD who would continue to be a resource to the FHWA and provide thoughtful and quality review of Option and Support statements. Of course, the FHWA would have to determine the legality of such a proposal or determine how to make it legal.

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**Randy McCourt on January 10, 2013 at 9:45 pm said:**

After Gene Hawkins and Jon Upchurch’s rah rah speeches at NCUTCD today I expected to see more people jump in with comments today! For those that do – I have added a few additional thoughts and ideas.

1) The future is not a book, pdf or set of files/sections as we know it today. The short term future will be touch screens, sections of information organized around user activities (engineering, design, field, technician) doing tasks and finding ways to access information they need faster and

with less commitment to the Buck Rodger code that has been the MUTCD. The evolution of design tools that pull in external sources of information (such as MUTCD) onto the work space through the touch of a icon or simple search allowing the user to select devices or application – review standards, options and applications along with the research/experiments that supported their inclusion in the MUTCD will be the next 5-10 years. Use of smart phones, tablets and other applications should be targeted in terms of how a user is able to access the material. Beyond that more artificial intelligence should be the next generation (20 years) and given the advance of vehicle technology – the opportunity that the MUTCD in the vehicle could emerge where vehicles use the traffic control devices as inputs to control vehicle navigation with vehicle to vehicle, vehicle to infrastructure and vehicle to cloud technologies.

2) To help this along the MUTCD needs to migrate to more visual (graphic) organization where each device is shown (sign, marking, TTC element,...), its standards, options, guidance, support and application information (which only part of may be MUTCD and the other information drawn from others sources are assembled in a virtual briefing book for each device including the Standard Highway Sign supporting material, research, experimentation and background of how its support evolved to the MUTCD through links. Every work that is defined is linked to pop up definitions and every cross referenced section can be hyperlinked – back and forth. Applications showing intersections, ramps, freeways and road applications would all be shown for the most common uses an engineer, designer, technician or field personnel may come across – and these would be linked to the sections (fact sheets/briefing book) for each device.

While we are not ready for artificial intelligence today – that is no excuse not to advance the MUTCD forward and consider a more graphic user interface now before the next MUTCD update. Taking a key step in this direction is needed now. It is better than simply dividing the MUTCD into two in the attempt to meet the immediate need to “reduce paper” as part of the Federal Register request. I am hoping the strategic plan is bold in its pace and effort to advance uniformity through improved comprehension, access and use of the MUTCD by acknowledging the emerging tools available to the profession and a broad group of users charged with improving the safety of our transportation system.

The beauty of the NCUTCD and the MUTCD is most of the core content exists and the process to support it in this emerging graphic world is in place. It just requires change and a little different perspective – not unlike those steps taken in the past to better organize the document for the times.

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**Susan Groth, MnDOT and the MN Committee on Uniform Traffic Control Devices on December 17, 2012 at 10:33 am said:**

MnDOT and the MN Committee on Uniform Traffic Control Devices comments on MUTCD White Papers and Vision/Strategic Plan issues

1. What are the strengths and weaknesses of the MUTCD?

Strengths:

Uniformity and consistency in TCD's

Is a legal document

Weaknesses:

Too many standards

Too big

Treatments aren't necessarily proven effective

Geared toward motor vehicles, such as passing zone criteria. It takes far less distance to pass a bicycle than a motor vehicle. But if you safely pass a bicycle in a no passing zone, you would be subject to a ticket.

2. What are the opportunities and threats facing the MUTCD?

Opportunities:

Able to integrate all modes of traffic

Threats:

it is losing credibility when major changes are made outside the rule-making/comments process, i.e. engineering judgment, definition of standard, substantial conformance

it loses credibility when those in charge of writing it do not have to apply it to real life situations

MUTCD gets so broad, we make changes, then the next time those changes get changed again, sometimes back to what they were previously. Example: warning sign spacing table; reduced speed ahead signs, overhead signs with down arrows

Increased national uniformity stifles innovation and makes it difficult to adjust for regional conditions. Example: 25 vs 30 mph statutory speed limits. The slight difference in speed limit makes a big difference in the size of street name signs.

3. Who is the target audience of the MUTCD? Who are the MUTCD stakeholders?

Target audience:

Engineering professionals

Engineers

Roadway authorities

Traffic Field personnel

City, County, Township and local officials

Stakeholders:

Policy makers

Traveling public

Attorneys

Vendors

4. What is the MUTCD supposed to be? (what is the goal of the MUTCD)

To be a resource for all who use/install/create traffic control devices to promote uniformity and usability

5. What should the MUTCD address? (what content should be included in the MUTCD)

Standards

Guidance

Options

support

Best practices

## Provisions for variation and experimentation

6. How should the MUTCD be structured? (what is the best way to organize the content)

We like the way it is organized now (chapter wise). It aligns well with our organizational structure.

7. What is the best means of revising the MUTCD?

a. should it be revised as an entire document or

b. should revisions address limited aspects?

We believe the MUTCD should be revised/updated a chapter at a time instead of the whole document at once. This will make it more manageable for states to thoroughly and thoughtfully review and provide comments. Having it as an electronic document will make this easier.

Any supplemental information/documents also need to be updated. For instance, the Standard Signs Manual should be updated at the same time as Chapter 2.

MUTCD Chapters should be revised/updated every few years along with housekeeping updates on other chapters that are affected by revisions.

8. What is the proper balance between identifying good practices and mandatory/recommended practices?

a. Mandatory practices should be minimized and should only include those standards which are critical (i.e. Stop signs shall be octagon and red) and proven effective. Fewer Standards and more Guidance.

b. Practices that have been proven effective over time should be guidance. For instance, while spacing is important to the effectiveness of a device, there are many factors that may determine where a device is ultimately placed in the field. Therefore, spacing/location should be recommended, not mandatory.

9. Can the MUTCD be all things to all people?

NO

10. What is a traffic control device?

From the MUTCD: "A sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, pedestrian facility, or shared-use path by authority of a public agency having jurisdiction"

11. 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? no

a. Such as, jersey barrier, truncated domes, guardrail

12. Who should be responsible for maintaining the MUTCD?

On the federal level, the FHWA under guidance of the National Committee

On the state level, the State DOT or State committee on Uniform Traffic Control Devices

13. Should the MUTCD be broken up into 2 or more documents?

NO – difficult enough now to cross reference things.

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**Jonathan Upchurch on September 18, 2012 at 9:39 pm said:**

Comments on White Paper # 1, by Jonathan Upchurch

Lines 6 and 7: I've done additional research on the statement in the Code of Federal Regulations that reads, "The MUTCD is the national standard for all traffic control devices installed on any street, highway, or bicycle trail open to public travel." This language has been in the Code of Federal Regulations since at least 1986, and possibly since 1983. In that era the MUTCD consisted of shalls, shoulds, and mayas. In essence, the MUTCD at that time consisted of what is now referred to as standards, guidance, and options. Yet, the Code of Federal Regulations referred to the document – in toto – as a standard. It is pretty clear that the word "standard", as used in the Code, has a different meaning than the definition of "standard" introduced to the MUTCD in the year 2000. So, again, I don't think it is a legitimate argument to say that because the Code of Federal Regulations refers to the MUTCD as a standard, that the MUTCD should consist only of standards (as defined in the MUTCD).

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**Jonathan Upchurch on September 18, 2012 at 2:07 pm said:**

Comments on White Paper # 6, by Jonathan Upchurch

Line 1: The title refers to Road Users, and the content of the paper appears to be only in the context of drivers. There are other groups of users that benefit from the MUTCD, including bicyclists (on both roadways and pathways) and pedestrians. The white paper either needs to: 1) explicitly state that its scope is only to cover drivers (while acknowledging that there are other types of users), or 2) expand to encompass the other types of users.

Line 17: "Drivers who do not have a drivers license," This could be more precisely stated as: "Drivers who do not hold a drivers license because they do not meet the level of knowledge required for a license, do not pass a vision test, or do not meet some other physical requirement."

General: Human factors experts and others have referred to the "85th percentile driver". There is clearly variation in mental and physical capability among drivers who are licensed and unimpaired. The white paper makes no mention of the older driver or the elderly (older older) driver. It seems like this needs to be a part of the discussion.

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**Jonathan Upchurch on September 18, 2012 at 2:06 pm said:**

Comments on White Paper # 5, by Jonathan Upchurch

Line 37 to 42: What are the devices that fall into each of these groups?

General: If there are multiple documents, and only one of those documents is the "official MUTCD", what is the legal standing of the remaining document(s)? Let's take Option # 1 as an example, in which Volume 1 is the "official MUTCD" and consists only of standard statements. What is the legal standing of Volume 2? It would not have the backing of the Code of Federal

Regulations, because it would not be the official MUTCD. Does a roadway agency have any legal obligation to follow the guidance statements in Volume 2? If not, it seems to me that this would reduce uniformity and reduce safety. What if an agency utilizes an option? What would be their legal justification for doing so?

This question of the legal standing of Volume 2 becomes even stickier in those states in which courts have ruled that guidance (should conditions) are essentially the same as standards (shall conditions). How would the fact that guidance is not in the “official MUTCD” affect these agencies? On the one hand, an agency might feel less obligated to follow guidance. On the other hand, the agency might do so at its peril because a court might have a different view.

Jim Pline made the good point that the MUTCD does not become the official document in a State until it is formally adopted by each individual State.

How would the content of Volume 2 be developed and adopted? The same question also applies to Volumes 3 and 4 in Options #2 and #4. Who would develop the content? Who would adopt the content? What would be the mechanism for adoption?

The question of who would develop and adopt the additional volumes also has an effect on the question of the legal standing of these volumes. If a volume is developed and adopted by some “unofficial” / non-government entity, how could it have a legal standing? Do we want to have the “hodge-podge” scenario in which some states adopt the lesser volumes and other states do not? Line 87 of the white paper refers to FHWA “accepting” documents from the NCUTCD (or some other entity). But, wouldn’t FHWA want to approve the content, especially if, as the white paper proposes, FHWA is the “owner” of the supplemental documents?

A further question is whether organizations (FHWA, NCUTCD, or others) have the capacity and resources to carry out these various options. The National Committee is a volunteer organization. What additional burdens would be involved in the various options? Would those burdens exceed the ability of FHWA or NCUTCD?

Any of these options, for initial execution, would appear to be at least as large an undertaking as the reformatting of the MUTCD in the 1990’s (ultimately appearing in the 2000 edition of the MUTCD). Some of the options appear to be even more involved. It would be an arduous task just to decide what text from the current Manual would go into Volume 1, Volume 2, and (for two of the options) into Volumes 3 and 4.

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**Jonathan Upchurch on September 18, 2012 at 2:04 pm said:**

Comments on White Paper # 3, by Jonathan Upchurch

Lines 23 and 24: This statement contends that there has been a conscious effort to provide information that could be used by individuals that did not have an extensive background in traffic engineering. I haven’t perceived such a conscious effort.

Lines 28 and 29: I don't think I agree that the increasing level of detail has made it more difficult to use engineering judgment.

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**Jonathan Upchurch on September 18, 2012 at 2:03 pm said:**

Comments on White Paper # 2, by Jonathan Upchurch

Lines 8 to 10: The text reads, "There are two audience groups of concern with respect to the MUTCD1, the audience to which the content is directed and the group of users of the MUTCD, which is larger than the target audience." This statement is abstract. It also presupposes that there is (for the current Manual) an audience to which the content has been directed. It would be better to delete this statement in this paragraph and allow the white paper to evolve to its conclusion.

Line 25: It reads: "when performing engineering activities that do not relate to TCDs." I haven't a clue what is meant by this. It would be very helpful to include an example.

General: This white paper describes many non-engineering users of the MUTCD. The use of the Manual by these non-engineering users has value. The white paper is silent on how the needs of the non-engineering users will be met if the MUTCD is written solely for an engineering audience. This is an oversight that needs to be addressed.

I agree with other commenters that the Manual needs to be written for a larger audience than just P.E.s.

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**Jonathan Upchurch on September 18, 2012 at 2:00 pm said:**

Comments on White Paper # 1, by Jonathan Upchurch

Lines 6 and 7 quote the Code of Federal Regulations, which states that "The MUTCD is the national standard..." As far as I know, we don't know who wrote this statement, and we don't know what they intended by the use of the word "standard" in this statement. The thrust of this white paper seems to be that because the word "standard" is used in "The MUTCD is the national standard...", that the Manual should be a document that consists only of "standards" (as defined in the MUTCD) and not include guidance, options, and support. At least this seems to be strongly implied by lines 13 to 15 which state: "Although defined as a national standard [in the Code of Federal Regulations], the current MUTCD includes not only standard statements (requirements), but also guidance (recommendations), option (options), and support (background) statements."

I don't think we should get hung up on the word "standard" in the Code of Federal Regulations. My thinking is that the Code of Federal Regulations is intending to say that the MUTCD is the document that identifies the common design, application, and use of traffic control devices that we want to be used throughout the country.

Just to emphasize again that "standard" as used in the Code of Federal Regulations does not necessarily mean "a statement of required, mandatory, or specifically prohibitive practice

regarding a traffic control device...“ (the definition of standard in the MUTCD), let’s look at the following. Here is a WORD thesaurus list of some of the meanings for the word “standard”.

Adjectives: normal, typical, average, usual, ordinary, regular, customary, prevailing, accepted, traditional

Nouns: norm, average, par, criterion, requirement, guideline, specification

At the risk of belaboring this point further, let me point out the chronological order in which the word “standard” was used in: 1) the Code of Federal Regulations, and 2) as a defined term in the MUTCD. The statement in the Code of Federal Regulations has been around for a long time. I’ve found documentation that this statement appeared in the Code of Federal Regulations at least as early as 1997. However, it is likely that the statement is much older than that. The defined term of “standard” didn’t appear in the MUTCD until the 2000 edition. I don’t think that the National Committee made any effort to, or had any intent to, create a definition of “standard” that coincided with the intended meaning of “standard” in the Code of Federal Regulations. The Committee simply developed definitions for “standard”, “guidance”, and “option” that represented the historical use of “shall”, “should”, and “may” in the MUTCD.

The point is that “The MUTCD is a national standard...” could have been intended to mean something different than that the MUTCD should consist only of standards (as defined in the MUTCD). I think that use of the statement in the Code of Federal Regulations is a weak argument for contending that the MUTCD should consist only of standards (as defined in the MUTCD).

Lines 32 and 33: I’m uncomfortable with the sentence that reads: “The key question is the relationship between the national standard definition of the MUTCD and how that relates to uniformity.” My discomfort lies with the use of “national standard definition” because I think it misleads the direction of the conversation. See my comments above. Here is a suggested replacement for that sentence.

“The key question is how can the MUTCD, and any other supporting documents, most effectively advance uniformity in meaning, appearance, application/selection, installation, operation, maintenance, removal, and safety aspects of TCDs?”

Line 36: The text should acknowledge that, in large part, meaning of a device is governed by the UVC.

Lines 36 and 37: In reading the list of activities or aspects, most of them are self-evident. The term “operation” may not be obvious to the reader. I suggest adding a parenthetical example, as follows: “operation (such as the sequence of indications in a traffic signal), “

Lines 51 to 57: This statement of purpose (and subsequent text) essentially says that the MUTCD will encompass meaning and appearance and that everything else will reside in some other document. This forces the remainder of the strategic planning process into the “multi-document” track. This is putting the cart before the horse. I think we need to pause and focus on the

question, “How can the MUTCD, and any other supporting documents (if any), most effectively advance uniformity in meaning, appearance, application/selection, installation, operation, maintenance, removal, and safety aspects of TCDs?”

Lines 54 and 55: If this statement of purpose goes forward (which I do not endorse), it is suggested that the wording be changed. I’m uncomfortable with use of the word “definition”. The suggested wording would be: “In this context, “meaning” refers to the message the device is intended to convey and the expected response from the road user and ....”

Line 56: Suggest adding “size” as an element of appearance.

Lines 51 to 57: I suggest an alternative purpose statement, as follows.

“The purpose of the MUTCD is to advance uniformity in meaning, appearance, application/selection, installation, operation, maintenance, removal, and safety aspects of traffic control devices.”

Line 59: Suggest replacing the word “definition” with the word “statement”. The text would read: “Implicit in this statement of the purpose...”

Line 61: If the goal is to determine the most effective way to advance uniformity in meaning, appearance, application/selection, installation, operation, maintenance, removal, and safety aspects of TCDs, I’m not yet convinced that dividing the current MUTCD into two documents is the best way to go.

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**Hal Perkins on August 28, 2012 at 3:04 pm said:**

My experience with private property owners (private roads open to public travel) is that they are very unfamiliar with the MUTCD and the guidance it provides. I think future MUTCD versions will need to be more instructive to private property owners, managers, and architects if nationwide conformity is truly desired at these locations. Perhaps a chapter dedicated to private property is needed.

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**Mark Luszcz on August 27, 2012 at 4:15 pm said:**

White Paper #1 Comments

I do not fully agree that “uniformity should be an objective that extends throughout all aspects of TCD use.” As many of us have discussed and argued over the last several years, there is a balance between uniformity and flexibility. Flexibility is required in some situations to account for local conditions, and it should be allowed in other situations where uniformity is not important.

In my opinion, the revised definition of standard and engineering judgment are acceptable and allow for the required flexibility needed to address unusual/atypical situations. However, there

are many situations where the manual is overly restrictive for no apparent reason. Three quick examples:

1. Logos/pictographs. There appears to be little rhyme or reason as to why some logos are allowed and some are strictly prohibited. They are allowed on acknowledgement signs, which in and of themselves are purely advertising in the right of way. But they are forbidden on memorial signs and very limited on supplemental guide signs (among others).

2. Street name signs. I'm baffled as to why the federal government cares what a local jurisdiction's street name signs look like. The "added flexibility" based on the recent rulemaking for historic districts is overly cumbersome at best. If a town has street name signs that are illegible – they are going to hear about it from their citizens/constituents/lawmakers/etc. Many towns and cities (not necessarily historic) like to have their own size/shape/color/logos/etc. to help "brand" their jurisdiction. On low speed urban roadways – this is innocuous, and the manual is overly restrictive.

3. "Supplemental" Green/Brown/Blue signs. In general, signs of these colors provide supplemental guidance to users. I doubt many in the public can explain why some signs are one color and some are another. Does it matter? If Delaware has brown attraction signs instead of blue – is that hurting anyone?

Has anyone ever done a more global study on the issue of uniformity? My understanding is that the Canadian MUTCD is essentially a recommended practice – not a required standard. I assume individual providences/agencies take advantage of the flexibility allowed. Are their roads less safe than ours? How about Europe? We hear all the time about all the wonderful things they're doing over there through scan tours, etc. The common theme of any European TCD issue seems to be that every country does things differently. Roughly equating European countries to U.S. states: are their roads safer than ours? I suspect the study I am looking for would have too many variables to control for . . .

And despite my complaints, there is a huge amount of flexibility already built into the Manual related to sizes, locations, signal head displays, etc. I suggest the U be taken out and we should simply have a TCD Manual.

As for the purpose of the MUTCD, I think we should consider the Canadian MUTCD model. The purpose of the federal MUTCD would be to create a best practices document on TCD's, which other federal agencies, states, and local agencies could adopt outright or use as a template for developing their own TCD manuals.

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**Matthew Peach on August 16, 2012 at 11:06 am said:**

Hello. My one concern is the "U" in the MUTCD. Many states / agencies develop supplements to the MUTCD or in California's case, do a full re-write.

I apologize if you have been or are currently working on this, but there should be an effort by the committee to reach-out to these agencies and at understand why they chose to diverge from the content within the manual.

If possible, efforts should be made to envelop those items with future editions of the manual. If not, the "U" in the MUTCD should be removed.

Regards.

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**Raymond S. Pusey on August 8, 2012 at 8:34 pm said:**

Hi Gene:

Your presentation on the Manual issues of size & content & for whom it is prepared was interesting.

My copy of the Manual is less than an inch thick and fits in my shirt pocket. If I need a larger screen, Tablet size will do. Any debate about its printed size or weight is not a real consideration in our digital world.

Guidance as to content depends upon who is using it and for what purpose, and gets to their education. At one end we have the professional engineer and at the other the high school drop out. The importance of this became clear as we moved in the late 1950's to implement Part 5 which is now Part 6. If we had any hope of getting a safe work zone, it would not come from handing out Part 5 or the entire Manual.

Utility foremen, guys who were excellent welders or pole climbers or ditch diggers, did not have to be college grads or even high school grads. They were not about to sit with the Manual and figure out how to sign and mark their work zone. And if they did, there was no hope that drivers would see the same set up for the same condition from work zone to work zone, let alone day to day. Uniformity was simply not going to happen.

Thus, we introduced what looked like current Part 6 as a separate document that contained explanation and layouts of what was required to be placed for various operational needs. It became somewhat of a standing joke that the layout pages were quickly covered by dirty finger prints and the explanation pages remained untouched.

The layouts were for the workers and the explanations for the courts.

Part 6 is the example of what is needed for the rest of the Manual to be useful at all levels. For example, on a road which crosses a RR just before reaching a Stop condition, the STOP AHEAD sign may, by its Standard, fall between the RR CROSSING sign and the actual crossing.

Would that confuse a driver about stopping for the RR crossing?

Where should the sign be placed and what influence does the distance between the RR and the intersection have on the answer?

Ideally, there should be an APP for that, just as Part 6 is an APP for work zone questions. And just as the signal design program, now being circulated, should be a first step APP for Part 4D.

If we have done the Manual well, many APP's will simply present a bundle of elements from the current pages, but the fun ones to write will be those that require the marriage of the three key Parts of the Manual.

My favorite one will say, "Hire a good Traffic Engineer."

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**Scott Wainwright on August 8, 2012 at 1:56 pm said:**

(continued from above comment on White Paper #6):

...increased violations of TCDs that aren't bright enough/noticeable enough to scream out loud enough to compete with the distractions for the distracted driver's attention. The MUTCD needs to continue to evolve to address this new reality, just as it has evolved to address the reality of larger numbers of older drivers and driver licensing with 20:40 visual acuity.

Also — the statement as written does not account for blind and vision-impaired pedestrians. "Is not traveling with and impairment that limits the operation of the individual" would mean that the MUTCD would not address the needs of blind or vision-impaired peds through accessible ped signals. The law of the land (ADA) says otherwise!

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**Scott Wainwright on August 8, 2012 at 1:49 pm said:**

White Paper #6:

Lines 58-65: This statement is great in a theoretical sense and is what we all WISH were true, But the reality is that many drivers, pedestrians, and bicyclists ARE and increasingly WILL BE operating as distracted road users — distracted by complex in-vehicle entertainment and navigation systems (even peds/bicyclists with ipod earphones), by cellphones (hands-free or otherwise), by glaringly bright and flashing/scrolling/full motion video advertising and billboards. My view is that, despite all good intentions of anti-distraction efforts, very little is going to change in the amount of distraction that road users will be subject to in the future. The traffic engineer is being called upon to deal with the effects of such distraction, as they show up as increased crash experience at locations that demand a high level of driver attention, increased violations of TC

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**Scott Wainwright on August 8, 2012 at 1:39 pm said:**

White Paper #5: In addition to my reply to Tom Heydel's comments, please consider also the following:

Lines 20-23, in Option #1, the "official" MUTCD (vol. 1) would more likely not be just the standard statements, it would probably be necessary to also include guidance statements deemed critical for uniformity plus option statements that modify the standard and guidance statements in vol. 1. Vol. 2 would consist of all the OTHER guidance, option, and support statements.

Lines 94-112: I concur with Maurice Palumbo's comments.

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**Scott Wainwright on August 8, 2012 at 11:37 am said:**

White Paper #1:

Lines 9-10: This statement is not really accurate. If you look at the table of contents of the 1935 MUTCD (available at: [https://ceprofs.civil.tamu.edu/ghawkins/MUTCD-History\\_files/1935%20MUTCD.pdf](https://ceprofs.civil.tamu.edu/ghawkins/MUTCD-History_files/1935%20MUTCD.pdf)) you will see that it does not just focus on meaning and appearance of TCDs — it contained a considerable amount of material on how/where devices were to be selected, located, installed, operated, and maintained. Yes, at that time appearance and meaning were perhaps paramount, but even in 1935 it was recognized that how a device was selected, where it was located, how it was operated (signals), etc. were very important uniformity issues that needed to be addressed to improve safety.

Lines 11-13: The increase in material has occurred gradually with each new edition issued – it is not just “the current issue” that has expanded it.

Lines 52-53: See my earlier comments on this statement of purpose.

White Paper #3:

Lines 34-35: I don't believe that other important standards, such as building codes, electrical codes, zoning ordinances, etc. artificially limit the size of their documents if the material is deemed important, as TCD uniformity certainly is. Size of document is immaterial when smart search engines, cross-indexing, hot links, pop-ups, etc. are available and used to make it easy for a user to find what he or she needs.

Lines 60-65: A true statement, but what about the State-to-State variations in TCDs that occur with the exact same (non-unusual) geometry, setting, etc.? These variations in TCD design, location, and application occur solely because of certain States' “preferred way of doing things” and their unwillingness to change over time to the MUTCD-prescribed way that is used by most other States. This non-uniformity cannot be ascribed to “engineering judgment” – it is purely a stubborn refusal to accept a basic principle of uniformity and refusal to change to adopt what the vast majority of other States have adopted.

White Paper #4:

Line 26: LEDs used in pavement markings should also be cited.

Lines 46-62: Add a bullet: “More complex operational strategies, such as managed lanes, ETC/non-ETC toll plaza lanes, shoulder running, variable mode left and right turn signals and flashing arrows, and many others.”

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**Scott Wainwright on August 8, 2012 at 10:54 am said:**

“MUTCD General Information” page on the Strategic Plan website:

Table 2 is misleading and does not examine in sufficient detail the question of why the number of shalls increased so much from 2003 to 2009. I have analyzed all of the new shalls that appeared in the 2009 MUTCD and the data shows that:

1) Of the 914 new shalls, 762 (83%) were the result of new topics added (toll roads, managed lanes, Flashing Yellow Arrow, community wayfinding signs, AFADs, and many others), and 325 (about 43%) of the shalls in that new material originated with NCUTCD recommendations sent to FHWA from 2003-2007; and

2) Of the approximately 1000 new shalls that were proposed in the Jan. 2008 NPA, the NCUTCD's docket comments disagreed with only 101 (about 10%) and the NCUTCD specifically concurred with all the other proposed new shalls. In addition, the NCUTCD's docket comments recommended 68 more shalls be added, beyond those that were in the NPA. This detailed analysis of data clearly shows that the 2009 MUTCD is not inherently "more prescriptive" than earlier editions and that the NCUTCD's recommendations and docket comments (which reflect the needs and desires of the MUTCD user community) are a major reason for the vast majority of the new shalls. I will be providing the complete data analysis to Gene Hawkins and asking him to make it available to all who are interested. The bottom line is that the MUTCD has increased in size and in the number of standards it contains because new operational strategies, new devices, and new applications have been developed by industry and by highway agencies at a much quicker pace than in the past, and these new developments must be addressed in the MUTCD or else they will be designed and applied in ways that decreases rather than improves overall uniformity on the streets and highways of the U.S.

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**Tom Heydel , WISDOT on July 22, 2012 at 3:58 pm said:**

Excellent breakdown of what the key elements and questions related to the strategic direction of the MUTCD. Comments are:

White Paper # 1 – Location and placement is extremely important to the effectiveness of at TCD. Human Factors research has shown that placing the device in the proper location for the condition the driver is encountering is vital to promoting safety. Accordingly, the location and placement needs to be contained within the MUTCD and not in a separate document.

White Paper # 2 – The list of who uses the MUTCD should also include "anyone who is either responsible for the installation of TCD's or installs TCD's." This could include private property owners, TCD installers such as contractors, public agencies or anyone who installs TCD's

White Paper # 3 – While it is not the role of the MUTCD to be educational, it does in fact serve that function as well and should be indicated as such. Engineers, Technicians, etc can learn from the MUTCD as to what devices are available to the practitioner.

White Paper # 5 – Adding more documents or volumes could make it more cumbersome since it can then promote adding to all the volumes in lieu of one document. It is also harder to be consistent from document to document versus chapter to chapter. Inconsistencies are already an issue from Chapter to Chapter. If one has separate documents or volumes it could compound the inconsistency.

Option # 1 –

This option in white paper # 5 is a problematic because often standards, guidance and option are interconnected for a particular device. For example: A warning sign use is often optional but once it is used then it's size, appearance and sometimes how it is used is a standard. Referring back and forth between two different documents is cumbersome.

Option # 3 in white paper # 5 – The problem with formatting it based on Federal statutes or UVC is that often State statutes may be the governing issue such as speed limits. State statutes vary to much to have the MUTCD based on Federal or UVC standards.

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**Scott Wainwright on August 8, 2012 at 1:31 pm said:**

I think Tom Heydel’s comments on white paper #5 are very important and useful, and I highly agree with them. I believe that any break-up of the current MUTCD content would be much more cumbersome to users and would have a great potential to result in less uniformity of TCDs on the roads — because inconsistencies between the “national standards” volume and any other volumes would undoubtedly occur. The NCUTCD, as a volunteer organization, likely does not have the ability to maintain the additional volumes in a way that assures consistency. The NCUTCD has shown over the years that it is not even able to maintain consistency between various Parts of the MUTCD when it develops recommended changes and new material — how could it hope to do so for the expanded amount of material that would go into the volumes beyond vol. 1?

The inevitable inconsistencies will (perhaps unintentionally) encourage some users to violate the Standards in Volume 1. This is especially true for those agencies that want to violate a Standard — they will find something in the other volumes that they will claim gives them “license” to do something different and non-standard, to the detriment of overall highway safety.

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**Mark Luszcz on September 20, 2012 at 4:34 pm said:**

Related to White Paper #5 – Please don’t forget to include the “no build” option. I think breaking the manual into pieces is a bad idea. I’d rather focus on improving the manual (through many of the other topics currently under discussion), but keep it as one manual.

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**Jim Pline on July 17, 2012 at 9:53 am said:**

#4 – Future of Traffic Control Devices

Good coverage into the future. I have a few comments and suggestions to consider.

Line 61 & 62: Yes, this is considered as “Aggressive Driving” and it has been on the increase for the last 20 years.

Line 98: You may want to show the “balloon affect” of aging drivers over the next several decades to illustrate this changing driver pattern.

Line 109: In-vehicle TCD displays or messages that supplement the messages of roadside TCD’s  
Line 118: due to in-vehicle or personal navigation systems.

Line 151: What is the typical aging pattern of the vehicle fleet?

Line 157: It appears that we are headed towards a “Nationalistic” approach to MUTCD provisions away from the individual “States Rights” adoption of a Manual. You may want to address this trend in the White Papers.

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**Jim Pline on July 17, 2012 at 9:52 am said:**

#3 – Level of Detail

With the electronic version of the MUTCD, page number does not appear to be a problem. My concern, would be the level of detail and the degree of cross-referencing to other documents. In Section 1A.11, there are 42 publications cross-referenced and there probably could be many more. With “Hot Links” the MUTCD reader could be provided with a bookcase of references for a specific device which “hopefully” the NCUTCD Technical Subcommittee used in developing the MUTCD provisions. To what degree of detail is need in the MUTCD versus the provided “Hot Links”? What are the legal ramifications of the “HOT Links”? Are they information (Support), other alternatives (Options), or recommended practices (Guidance)? Should the “Hot Links” material be reviewed and approved by the appropriate NCUTCD Technical Subcommittee?

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**Jim Pline on July 17, 2012 at 9:51 am said:**

# 2 – Target Audience

I would agree with Roger. The MUTCD needs to be written for more than the PE. The Manual is also used by the field personnel and technicians in the application of devices. Not all of the field work is covered by agency policy or procedures nor do we want it to be. Leave room for engineering judgment. Neither should we expect every jurisdiction to develop their own policies and procedures or adopt those developed by others. Tis “White Paper” emphasizes the PE involvement. However, there is nothing in the MUTCD that requires a PE. It has been stated over the years that an engineering study can vary from notes on a napkin to a PE signed document. That needs to be clarified in the MUTCD. I, personally, would like to see a PE signed engineering study for a traffic signal but do not need one for Advisory Speeds if the technician follows recommended practice. How many of the MUTCD required engineering studies do you see a PE signed document or need one? There are a number of national engineering recommended practices that form the third leg of the stool between engineering study and engineering judgment. Should this third category be established be lessen the load on engineering studies if you expand the document requirements? If the field person or technician follows the recommended practices does it take the decision out of the realm of direct engineering overview or an engineering study? What does the technician need to record to document that they followed recommended practice? Is it necessary that a PE review the field work and sign the document as an approved engineering study? Would the same rationale’ apply to compliance with agency policy or procedures that supplement the MUTCD? Are these Agency provisions, “Recommended Practices” or “Engineering Directives”? The courts usually judge the State MUTCD Supplements the same as the Manual and frequently, give the same weight to written agency procedures.

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**Jim Pline on July 17, 2012 at 9:49 am said:**

Reducing the MUTCD to meaning and appearance essentially make the Std Hwy Signs publication the Manual of Standards if we add meaning at the top of each page. Additionally, the

NCUTCD has strived since 1970 with the use of symbols and brief legends to make the meaning of the devices self-evident. At the same time, specific standard provisions have been included in the MUTCD based on field experience applying the device. Would these decisions revert to engineering judgment? I am more in favor of packaging the device provisions based on each device as is now done. A device is added to the MUTCD because it has national application considerations. There may be standards associated with it such as legend, color, size while the usage may be guidance or optional. Once a person in the field is exposed to the device, don't we need to tell them how to use it? If not in the MUTCD, then where?

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**Fred Ranck on July 11, 2012 at 8:23 am said:**

The fundamental inadequacy of transforming the MUTCD into a "Guidance" type document for use by "engineers" only is that city councils and county boards and state legislatures will ignore "guidance" and do their own thing with traffic control device designs and applications; the fundamental element of the MUTCD of today is that the basics of the MUTCD have the standing of legal requirement ("shall") backed up by 23 CFR 655 which require (legally) the states to adopt and to so adhere to. Far too often, the only thing standing between a City Council or County Board approving an ordinance at 1am in a long meeting for "their" sign design or for a new traffic signal or all-way stop is their action would be a violation of the law of the MUTCD.

For example, states may ignore an engineering guidance policy document such as the state of Vermont's decision that the guidance values for geometric design of highways need not follow the AASHTO Policy on Geometric Design; rather the Vermont State Legislature selected their own values for vertical and horizontal curves and superelevation, etc.

"Uniformity" of traffic control devices continues today for only one reason...because uniformity is required by law. Without this legal aspect, "uniformity" fades away like "reel lawnmowers" and manual typewriters. Transforming the MUTCD of today to a guidance document for use by engineers only means the end of uniformity of shape, color, and application across the 50 states.

Fred Ranck, retired County and City Traffic Engineer

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**Randy McCourt on July 10, 2012 at 8:54 pm said:**

Similar to comments I made at the NCUTCD meeting in June, here are my key points:

- 1) Having a Manual, Application and Best Practice is a good idea. Given the amount of changing traffic control device issues that emerge, adding an EMERGING PRACTICE component would be good too so folks are not always trying to get their latest idea into the manual to advance their concept before it is fully vetted, field tested, researched and proven to be "manual worth". Emerging practice provides a good harbor for these developments.
- 2) To build off the the multiple elements – functionally if the future web site would allow "pop ups", short cuts or hot links to the applications, best practices or emerging practices in the

manual topic area – this free flowing ability to access information will enrich the user experience and make the manual even more valuable to users in the future (particularly unfamiliar users). This linkage concept could be expanded to include the research that was done on the signs/markings/signals/TTC originally to allow a user great ability to core into depth certain devices – aiding in users applying better judgement in design.

3) The MUTCD html version needs a better search engine – the .pdf version does wonderful word searches in the document. The html version gives you 2003 MUTCD reference as top links in a word search commonly – not helpful. Searches are a critical aspect to good user performance and aids the greater use and application of MUTCD in the practice.

4) Having the MUTCD be an open web site (html or pdf) is key to the goal of uniformity and consistency. This is key to many agencies that do not spend money on the most valuable tools some times. Affordability should be retained.

5) Living in an environment where project funding is constrained with more ready to build small projects place even greater emphasis on the need for the MUTCD in the future to provide low cost project applications of traffic control devices as an alternative to huge capital intensive projects which are harder to fund. Therefore an easy to access, user friendly MUTCD fits into any future scenario providing benefits to the public – low funding or improved funding.

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**James Pline on July 5, 2012 at 11:37 am said:**

Under Legal Status, MUTCD Information, I would suggest a comment that the MUTCD does not become the official document in a State until it is formally adopted by each individual State. Some States have a State law that adopts the FHWA MUTCD at the time it is adopted by FHWA. Others, go through State administrative rulemaking whereas they adopt the FHWA in total as published, adopt it with a State Supplement, or now in rare cases adopt their own State MUTCD.

It should also be noted somewhere that the provisions for TCD's on private property are not applicable until a State modifies their law of MUTCD adoption by adding the provisions of UVC 15-116 (MUTCD Section 1A.07 (08)).

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**Richard C. Moeur on June 21, 2012 at 8:53 am said:**

Issues that will need to be addressed:

1. Clarification by FHWA of the role and impact of the 23 CFR 655.603 definition of “substantial conformance” on all the proposed documents, including the supplementary references.
2. The continuing need for standalone printed hardcopy references for some users, such as an easy-to-use compilation of all relevant standards & practices (from all the proposed volumes) for use by temporary traffic control crews & inspectors in the field. One strong message I have

received in giving MUTCD training to field crews is the continuing reliance on hardcopy documents for field reference.

3. The continuing push toward integration of traffic control and vehicle guidance – but recognizing that many road users (such as bicyclists & pedestrians) will still rely on conventional traffic control devices long into the future.

My preferred definition of “uniformity”? Setting national standards & guidance on a core set of specific critical traffic control concepts, while allowing flexibility by state & local agencies on implementation of devices and concepts.