COMMENTS ON PROPOSED RULE

National Standards for Traffic Control Devices: Manual on Uniform Traffic Control Devices for Streets and Highways; Revision

I am submitting the following comments based upon my background and experience in working with and applying the principles of the MUTCD over a 45+ year career as a professional engineer (P.E.). My perspective and experience rely heavily upon my 26+ years as a county traffic engineer, five years as a city traffic engineer, and over 15 years as a traffic engineering consultant. I have taught classes and seminars on various parts of the MUTCD, most notably for the American Society of Civil Engineers (ASCE), and served on the National Committee on Uniform Traffic Control Devices (NCUTCD) for 17 years as a member of the delegations representing the Institute of Transportation Engineers (ITE) and the National Association of County Engineers (NACE).

General

I wholeheartedly support the issuance of the proposed, updated, new edition of the MUTCD, and on its continued use as a national standard for use and application of traffic control devices. It is vitally important in its role for promoting uniformity, safety, and consistency of use on all streets and highways open to public travel across the country. It serves all road users: vehicle drivers, pedestrians, bicyclists, and the disabled. This updated, new edition is long overdue (since the last Manual was 2009), and as such, it needs to be Federally approved and formally adopted as soon as feasible after your careful review and consideration of all comments received.

Section 1D.08. I support traffic control device (TCD) design and application in the public domain. This is particularly important for local agencies (cities, counties, townships) to have easy and available access to the use of TCDs that are unburdened by patents or special use requirements. Having them in the public domain immeasurably promotes widespread and consistent application of approved TCDs.

Table 1D-1. I support the acceptable abbreviation of "AV" for Avenue on street name signs. I formerly worked for a local agency that used "AV" (as well as "ST", "BLVD", "DR", "HWY", "MT", "PKWY") on its street name signs, and there was never any doubt or confusion experienced by the public or by fire districts. I was always surprised that the older Manuals prescribed the use of "AVE."

Section 2B.21. The portion of the new Guidance statement that begins with, "Among the factors that should be considered when establishing or reevaluating speed limits within speed zones are the following:" along with items A through D is particularly good and reflects the long-standing practice that I am most familiar with and have applied. Its wording, which includes the speed distribution of free-flowing vehicles, will hopefully clear up the misunderstanding of some who think the 85th percentile is the only factor used in determining an appropriate speed limit.

However, the statement later in the Guidance section, "Except in urbanized locations within rural regions, when a speed limit within a speed zone is posted on a rural highway, it should be within 5 mph of the 85th-percentile speed of free-flowing traffic vehicles," is problematic and if adopted, would undoubtedly force most local agencies to have to justify exceptions on their highway system to this "Should" statement. Some examples:

a. A highway going through a small, unincorporated community. It is not "urbanized", but it could have a country store, a rural post office, perhaps a gas station, or maybe a community hall or a real estate office. There might even be a small cluster of a few houses. It is

customary for most local agencies to lower the speed limit through such an area, even though it is in a "rural region." Primarily for safety reasons.

b. A popular recreation area, such as a state park or community park, where there could be a larger campground, day use picnic, historic features, etc. that prompt pedestrian crossings of the highway, vehicle turning movements, parking along the roadway shoulders, etc.
c. A rural highway running along a large lake, ocean, scenic geological formations, etc.
d. A rural highway that evolved over time and was not constructed to any design standard, thus perhaps having curvilinear alignment, vertical curves, narrower shoulders, etc. that could prompt consideration of a lower speed limit.
e. Also, what is the definition of an "urbanized location" within a rural region? There is no definition of "urbanized" in Part 1 of the Manual. In my experience, a local agency (e.g., a county) could have land use designated areas of "urban" and "rural" along with "activity centers" or "rural centers" etc. The use of "urbanized location" seems problematic.

These are just a few examples. For these reasons, I favor deleting this part of the Guidance statement (in particular, deleting the within 5 mph of the 85th percentile) and having the Guidance statement that lists factors A through D apply to rural highways also. At a minimum, the intent of the "within 5 mph of the 85th percentile" reference should more clearly be described, perhaps in an accompanying Support statement.

<u>Federal Register request for comment regarding setting speed limits</u>.

a. Removing consideration of the 85th percentile speed? NO. I strongly support the proposed Guidance language that identifies the many factors that should be considered when establishing or reevaluating speed limits, including item A, speed distribution. The availability and consideration of the speed study data (85th percentile, mode, mean, 10 mph pace) provides important insight in helping to determine an appropriate recommended speed limit. As a long time practitioner, I have always considered speed data, 85th percentile included, as well as the other factors listed in items B, C, D of the proposed language. In most instances, an agency cannot always rely upon consistent speed enforcement (considering other policing needs these days), so there are times that the 85th percentile provides insight as to what a potentially realistic, reasonable speed limit might be. Removing consideration of the 85th percentile would be a mistake.
b. Requirement to use an expert system to validate a speed limit? NO. The proposed Guidance language that identifies the many factors that should be considered when establishing or reevaluating speed limits is very appropriate and more than adequate for agencies to follow and comply with. Requiring use of an expert system would cause undue burden and challenges for the many small and medium sized local agencies (e.g., counties, cities, townships) to implement, as it is not unusual for these agencies to have no traffic engineer or similar professional expertise on their limited staff (perhaps only the availability of a licensed P.E. with general overall civil engineering background, or with a more specialized expertise in other than traffic/transportation). I would support including the reference to use of an expert system, such as USLIMITS2, in the currently proposed Support statement, but not as a "Shall" or "Should" statement.
c. Increased use of automated enforcement for speeding? This would be a legislative (societal?) challenge. In my state, our legislature has approved automated enforcement only for red light running, school speed zones, and for railroad crossings. A proposal to approve automated enforcement for exclusive transit lanes in our major cities was not approved. The safety culture in our society does not appear ready to accept automated enforcement for any or all speed zones, other than for school zones.

Section 2C.06. For the use of horizontal alignment warning signs, applying Table 2C-4b & Table 2C-4a, the proposed Standard language requires that the "speed differential shall be the difference between the horizontal curve's advisory speed and the roadway's posted or statutory speed limit or 85th percentile speed, whichever is higher, or the prevailing speed on the approach to the curve." This requirement is very problematic: Including the words, "*whichever is higher,*" indicates that a vehicle speed study is required to determine the 85th percentile, as a means of definitively identifying the highest of the posted, statutory, or 85th percentile speeds. Requiring a speed study for every approach to every candidate curve for proper signing selection would be burdensome, costly, time-consuming, and labor intensive for agencies. The "*whichever is higher"* term should be deleted and use of "posted or statutory speed limit" should remain. The use of 85th percentile could be made available as an Option.

Also, the proposed adding of "*or the prevailing speed*" in the Standard statement is also problematic; what is the definition of "prevailing speed?" There is no definition for it in Part 1. There are definitions in Part 1 for posted speed limit, 85th percentile, statutory speed limit, average, design, operating speeds, and pace. The reference to "prevailing speed" should be deleted.

I would point out that the inclusion of the "*whichever is higher"* wording is inconsistent with use of speed in nearby portions of the Manual: (a) Later in Section 2C.07, it states, "A Turn sign (W1-1) should be used instead of a Curve sign (W1-2) in advance of curves when the advisory 35 speed is half or less of the posted speed or a speed differential of 25 MPH or more." There is no reference to 85th percentile or prevailing speed, nor should there be. (b) In Table 2C-3, Advance Placement of Warning Signs, the speed column is labeled, "Posted or 85th Percentile" speed. There is no reference to "whichever is higher."

Section 2C.13. Regarding the Vehicle Speed Feedback sign, I support prohibiting the use of strobe lights, changing colors, or use of other dynamic elements, as I find them distracting and having the effect of potentially minimizing other nearby important traffic control devices by drawing undue attention. Also, there appears to be no consistent use of these features from one location to the next, or from one product to another. I also wonder about any detrimental effect a strobe, for example, might have on some drivers from a health standpoint. However, for the sign to be effective, I do support allowing the speed display to flash if the speed detected is over the posted speed limit (especially if it is 5 mph or more over the speed limit), provided the display does not change color and there is no additional message such as "SLOW DOWN" provided. "Slow Down" is not a static sign legend included anywhere else in the MUTCD, so why allow it in a Vehicle Speed Feedback sign?

Section 3A.04 & Section 3B.09. I do not support changing the definition of Normal width line to 6 inches wide, nor requiring all conventional roads with speed limits over 40 mph to have 6 inch wide lines. I also do not support the Guidance statement, "Regardless of the width of the normal line used on the roadway, edge lines on two-lane roadways should be at least 6 inches wide."

This proposal would have a major impact on highway agencies, on striping operations, increased maintenance costs, and increase in materials (paint & beads, typically for local agencies). In my former agency, the most expensive longitudinal line to install and maintain is the edge line, because it uses noticeably more paint and beads than a center line or edge line. And this was despite our ability to stripe one of the edge lines on a two-lane road simultaneously with striping the center line. Increasing the required or recommended width to 6 inches increases this already significant paint & bead quantity by 50%. Given the amount of edge lines being maintained annually on an agency's suburban and rural

roads, increasing the normal edge line width to 6 inches would result in significant operational and maintenance costs, basically constituting an unfunded mandate.

I gather that the proposed line width change stems from a desire for "improved machine vision detectability," and I understand the desire to try to get a start on this apparent infrastructure improvement. However, automated vehicles are still in their formative stages, and there likely will be many additional technological advances in the near term. It seems too early to begin mandating that all highway agencies (particularly local agencies) increase their line widths now, while at the same time providing no additional funding or resources (which these agencies sorely need).

If FHWA does not concur with these concerns and proceeds as proposed, here are some alternative approaches to consider:

a. Provide the Federal funding necessary to implement the proposal.
b. Implement the 6 inch wide lines as Guidance, not as a Standard.
c. Increase the speed limit threshold to 50 mph and above. I do not believe that AASHTO considers 45 mph as a "high speed facility" (which is alluded to in the docket).
d. Implement the 6 inch wide lines only on conventional roads for which edge lines are required (i.e., edge line warrant, 6000+ vehicles per day).
e. Consider an initial implementation strategy of recommending (i.e., Guidance) use of 6 inch wide edge lines on curves with a significant speed differential (speed limit vs. advisory speed) and higher reported crash history.

The Guidance statement in Section 3B.09, "Regardless of the width of the normal line used on the roadway, edge lines on two-lane roadways should be at least 6 inches wide," is way too broadly written and too far reaching, affecting virtually every city, county, township in the country (with no additional funding being made available). If the proposal is adopted as written in the Proposed Rule, there may be unintended consequences of agencies limiting the striping of edge lines only to those roadways that meet the Standard & Guidance for edge line warrants, due to budgetary constraints. That then could have a potentially detrimental effect on road user safety.

Section 3B.05. I do not support the Guidance statement, "Two-way left-turn lane markings should not extend to intersections." In urban and suburban settings, particularly in commercial or built-up areas or where intersections along an arterial or collector are spaced more closely together (e.g., every block, 350 ft apart or so), providing a continuous two-way left turn lane (breaking the striping at intersections) is quite common practice. This application has operated safely and effectively for as long as I can recall (45+ years of practice), so it is very surprising that such a Guidance statement recommending against it is being proposed. I might also mention that an added benefit of providing a two way left-turn lane at minor (typically local access) street intersections is that their presence also allows side street traffic to first turn left into the two way left-turn lane and then make a lane change into the adjacent through lane when heavy through volumes occur.

Perhaps there is a typo in the proposed language? Should it have read, ""Two-way left-turn lane markings should not extend **through** intersections." (emphasis added). I would support that.

Section 4F.19. Regarding the Standard statement, "The shortening or omission of any pedestrian change interval shall be permitted only when the traffic control signal is being preempted because a boat is approaching a movable bridge or because rail traffic is approaching a grade crossing." This statement prohibits the shortening or omission of any pedestrian change interval at any signalized

intersection away from a movable bridge or rail grade crossing. The most common situation that would be affected is emergency fire and aid car responses, both of which utilize very loud sirens along with flashing red lights as a part of their response, far in advance of the signalized intersection. Pedestrians can hear and/or see these responding vehicles and it is still incumbent upon the emergency vehicle driver to take note of all vehicle and pedestrian traffic at the intersection. For these reasons, having a strict prohibition from shortening or omitting any pedestrian change interval is overly restrictive; instead, it should be a recommendation (Guidance) that in these instances the pedestrian change interval ***should not*** be shortened or omitted. There have been instances where such exceptions have been supported and safely implemented with no reported concerns from pedestrians.

Sections 4J.02 & 4L.01. I support allowing the use of the Pedestrian Hybrid Beacon and the Rectangular Rapid Flashing Beacon at intersections. Research and application of these devices at intersections appears to support their effective use at intersection locations.

Part 5 Automated Vehicles. The stated purpose of "providing agencies with general considerations for vehicle automation" is a worthwhile goal. However, these "general considerations" eventually begin to turn into Guidance statements: "Agencies should adopt traffic control device maintenance policies and/or practices…" and "Agencies should apply the following fundamental principles and considerations…" followed by more Guidance statements for signs (5B.01), markings (5B.02), signals (5B.03), temporary traffic control (5B.04) plus a Standard statement, rail crossings (5B.05), and bicycle facilities (5B.06). That every local agency (e.g., city, county, township) in the country should take these actions is overreaching at this time and reads as a mandate to take action when the stated purpose at the beginning of Part 5 is to "provide agencies with general considerations."

While there is useful and helpful information being provided in Part 5, it should be that: information to provide some insight into the future of automated vehicles as a norm on our highways. Rather than providing any Guidance statements, the FHWA should instead provide national leadership on educating, helping, and facilitating local agencies on how to best begin to evaluate what steps can be taken to begin preparing for infrastructure changes as they potentially affect traffic control devices. I cannot imagine that, with this proposed language as it is presented in Part 5, that the typical local agency has much of an idea of where to even begin.

As for some possible alternatives:

a. Do away with Guidance statements in Part 5 at this time. Aim to educate and provide insight as to what future impacts vehicle automation is going to have on operation and maintenance of traffic control devices.
b. FHWA take a leadership role in developing local agency model maintenance policies and practices, perhaps in a modular or menu-driven format so that agencies can select those that they feel would best apply to their system and their resources, their expertise & capabilities.
c. If the FHWA desires to retain the proposed Guidance language (and thus wanting all local agencies in the country to act), then FHWA should consider separating the entire new Part 5 from the current rulemaking and develop its own Proposed Rule. Otherwise, it seems that in its present form, the current message/emphasis/attention desired for the automated vehicles measures in Part 5 is seemingly going to be lost or minimized by reviewers/commenters who are considering all the other hundreds of proposed changes in the other parts of the Manual that are in the voluminous Proposed Rule.

Section 8D.10. The following statement should be slightly modified: "The highway agency or authority with jurisdiction, and the regulatory agency with statutory authority, if applicable, and the railroad company or transit agency should jointly inspect and verify the preemption operation, the amount of warning time and/or advanced preemption time being provided by the grade crossing warning system, and the timing of highway traffic signals interconnected and/or coordinated with the flashing-light signals at least once per year." Rather than prescribing, "*at least once per year"* for all preemption locations, it would be more practical to recommend or obligate the agencies to conduct their inspections of each preemption location on a regular, periodic, documented basis. In addition, an inspection should be scheduled if there is any signal or operational or physical change to the signals or crossing (versus sometime within a year). However, if there are no changes, prescribing "at least once per year" seems very specific, perhaps overly so. In addition to using wording such as "regular, periodic, documented basis," perhaps a Support statement could be added to offer that a typical practice would be to conduct the inspections annually or at least every two years, for example.

Submitted by:
James W. Ellison, P.E.
Consulting Traffic Engineer