



CITY OF CAMBRIDGE

TRAFFIC, PARKING, + TRANSPORTATION

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May 14, 2021

Stephanie Pollack
Acting Administrator (HOA-1)
Federal Highway Administration
1200 New Jersey Avenue, S. E.
Washington, DC 20590

RE: Comments on the Notice of Proposed Amendment for the Proposed 11th Edition of the Manual on Uniform Traffic Control Devices

Dear Acting Administrator Pollack:

I am pleased to provide comments from the City of Cambridge on the December 2020 Notice of Proposed Amendments (NPA) to the Manual on Uniform Traffic Control Devices (MUTCD). These comments are the result of a thorough review by employees in several City of Cambridge departments and are provided to FHWA with the goal of enhancing the MUTCD so that it may provide clear, well researched guidance to practitioners to design and operate streets that are safe for all users.

In reviewing the document, we have kept in mind the needs and realities of smaller communities such as ours, who often refer to the MUTCD to provide state of the practice guidance to better design our streets to promote safety, equity and sustainability. The NPA adds a significant amount of new content that we support, and that will support our efforts to design streets with safe and modern multimodal facilities that are designed with the safety of vulnerable users as the top priority.

The comments outlined below identify the sections of the MUTCD where we have the most significant concerns. Overall, our comments are provided with the goal of creating an MUTCD that better serves all street users. The MUTCD was originally developed as a document focused on the safety for drivers of motor vehicles. The manual has evolved over the last three decades to provide more guidance on pedestrian, bicycle, and transit facilities and the proposed NPA does further that effort. However, we continue to believe that there are significant changes needed to the 11th edition to prioritize the safety of vulnerable users on our roadways and meet the goals that have been stated by the Biden Administration and Secretary Buttigieg.

In addition to our comments, which are outlined below organized by chapter, we also want to express our support for the comments that have been submitted by the National Association of City Transportation Officials (NACTO), the Institute of Transportation Engineers, the Association of Pedestrian and Bicycle Professionals, Transportation for America, and America Walks. In particular, we stand in support of NACTO's request that FHWA seize this opportunity to rewrite and reframe the MUTCD

in a more fundamental way, with a focus on safe systems approach, equity for all users of the street network, and a true commitment to sustainability in all its forms.

Part 1

- **1A.03 Target Road Users** – This section unrealistically identifies target street users who are “alert and attentive,” “reasonable and prudent,” and “operating in a lawful manner.” This definition fails to recognize the enormous range of urban street users, as well as the inevitability of human error and the fact that we should seek to not have users punished for those errors. Most children, for example, would not meet this standard, nor would people with certain disabilities. By including it, the Manual implies that engineers are only responsible for protecting road users who meet this specific impractical definition. This language should be eliminated or significantly modified to focus on creating a safer system that does not function solely for users who meet those unrealistic expectations.
- **1B.06 Experimentation** – The proposed changes to this section make a process that is already overly complex even more challenging. This creates a barrier for smaller state and municipal agencies that do not have the resources to address the involved requirements for experimentation. Simplifying the requirements for experimentation and setting the process as guidance rather than a standard will increase the ability of many agencies to engage in experimentation, which will provide a net benefit for all practitioners through increased availability of data on new devices.
- **1B.08 Interim Approvals** – The NPA proposes to change to a standard (from guidance) the item requiring municipal agencies to maintain a list of implementations of traffic control devices subject to interim approval. This is an undue burden on both the municipal agency to continuously update the list as well as the state agency which must maintain lists from hundreds of municipalities. There are over 20 interim approvals issued since the 2009 edition, some of which have been in effect for over a decade. In the City of Cambridge alone, we have over 500 devices installed under various interim approvals. Updating this list and requiring the Massachusetts Department of Transportation to maintain these lists for all 351 cities and towns in Massachusetts is burdensome and does not provide any clear benefit.
- **1D.11 – Placement and Operation of Traffic Control Devices** – Placement of all traffic control devices on a roadway prior to opening to general traffic is not always feasible or necessary depending on the volume of traffic, intensity of use, and other factors related to engineering judgement. This standard should be changed to guidance.

Part 2

- **2B.21 Speed Limit Signs** – This section does not represent best practice and research on setting speed limits, especially in urban and suburban environments. The 85th percentile method is not a viable or appropriate means to set speed limits on roadways where vulnerable users are present. We

recommend that the manual remove all guidance on speed limit setting, which should be left to engineering judgement and local jurisdiction guidance.

- **2B.20 In-Street Pedestrian or Trail Crossing Sign** – This section does not reflect current use and practice, nor does it follow research already conducted. The changes proposed are unnecessarily restrictive and should be changed to a guidance statement.

Part 3

- **3H.06 Green-Colored Pavement for Bicycle Facilities** – The proposed restrictions on the use of green colored pavement are not consistent with past interim approvals and with implementations in cities across the country. The text newly proposes that green colored pavement shall not be used in
 - Shared use paths – There are several uses for green markings in shared use paths, such as a location where an exclusive bicycle facility crosses the path. A blanket prohibition on the use of green unnecessarily restricts design options for intersections.
 - Shared lane markings – Past interim approvals allowed the use of green backed shared lane markings, and there is no research that supports a prohibition on their use. In Cambridge we have used these on several corridors with success. The green backing adds significantly to the visibility of the markings for drivers and increases comprehension, as the color green is widely associated with bicycle use.
 - Separated bicycle lanes – It is unclear why the NPA restricts the use of green for separated bicycle lanes *on an independent alignment*. The use of green should be permitted on all types of bicycle facilities.

The NPA makes it a standard that where green is used for bicycle lane extensions through intersections, *the pattern of the green-colored pavement shall match the pattern of the dotted lines*. We are not aware of any research that supports this statement. Rather, research consistently finds the use of green color increases motorist awareness of bicycle facilities, with evidence showing increased driver yielding. Indeed, the safety benefits of colored treatments of bicycle facilities goes back decades, with research looking at blue lanes originally, where it was demonstrated that when blue was added to bike lanes through the intersection, significantly higher numbers of motorists yielded to cyclists and slowed or stopped before entering the colored pavement areas. Green was subsequently selected as the color for bicycle lanes and through information gathering for national studies, it is well known that many agencies use green pavement markings as the preferred treatment for identifying conflict areas. Further, it is well documented that green markings for bicycle lanes have been viewed favorably by all road users.

The City of Cambridge, along with these many other cities across the country, uses a standard marking that consists of a solid green marking across the intersection in between the white skip extension lines. The solid green marking is more visible to drivers and allows for the use of the bicycle symbol and arrow in the crossing, thus more clearly communicating the use of the lane and the expected direction of travel for a bicycle. With a skip green marking, it would

not be feasible to also include the bicycle symbol and arrow. We recommend that the text be changed to allow two options: solid green or a pattern matching the adjacent dotted white lines. We further recommend that there not be restrictions on the exact placement of the green and that it be explicitly allowed as backing for Shared Lane Markings and on all bicycle facilities.

- **3H.07 Red-Colored Pavement for Public Transit Systems** – The proposed item in the NPA requires that an engineering study be performed to document the benefits of a red colored pavement treatment prior to installation. This is an undue burden on agencies and is not necessary given the documented benefits of these treatments from research. As the person who initiated the first experiment with red bus lane treatments in New York City, I feel particularly strongly that this treatment has become a national standard that is well understood, and that the engineering study requirement should be removed from the MUTCD. The section also has conflicting language, which states as a standard that red-colored pavement shall not be used where traffic is allowed to occupy the lane. However, the section also provides an option which allows for use in a part-time operation, which would thus allow traffic to occupy the lane outside of those hours.
- **3H.03 Aesthetic Treatments in Crosswalks** – This standard is unnecessarily restrictive and not based on any evidence or research. The City of Cambridge has used similar treatments for decades, to the benefit of the community, and with no known or proven safety problems.

Part 4

- **4C Traffic Control Signal Needs Studies** – The entire section on signal warrants is severely outdated and requires a significant overhaul. The 8-hour vehicular warrant has not been updated since 1961, while the other vehicular volume warrants date to 1978. The most concerning issue with warrants is the disparity between Warrant 4, Pedestrian Volume and the warrants for a Pedestrian Hybrid Beacon (PHB). The PHB volume warrants are significantly lower, while the function of the signal is very similar. In urban locations along a signalized corridor, it is often most appropriate and consistent for a standard traffic signal to be provided where pedestrian signalization is needed, as the PHB may be confusing for drivers facing a green light at a downstream signal.
- **4H.01 Use of Bicycle Signal Faces** – We appreciate that the NPA provides increased flexibility for the use of bicycle signals compared to what was permitted under Interim Approval 16, allowing for improved intersection designs. We have noted, however, that when conflicting turning movements exist, a flashing yellow arrow is required for that conflicting movement to alert the driver to yield to conflicting bicycles and or pedestrians. We have noted that Chapter 4 does not provide for optional shared signal faces for locations which lack a left turn lane. We recommend that the NPA be revised to show an optional configuration for a shared through/turn signal face for use at locations with shared through/turn lanes where the turning movement is operated as permissive only. The signal head could either be provided as a four or five

section head, displaying both a green ball indication and a flashing yellow arrow for the duration of the phase where the bicycle conflict exists.

- **4H.04 Bicycle Signal Signs** – The NPA creates a standard that requires a bicycle signal sign adjacent to all bicycle signal heads. We recommend that this standard be reduced to guidance, as our experience has shown excellent user comprehension of bicycle signals without the sign, assuming that the signal is well designed and visible to all users. We also recommend that FHWA revisit the requirement for signs with lane use arrow indications indicating which movements are controlled by the signal, as this is likely to have extremely poor comprehension by most users. This is not how lane use arrow indications are used for vehicular signals, and this lack of consistency will likely be a problem. Additional research on this topic is needed before a standard is established.

Part 5

- We have significant concerns with the content provided in Part 5 and believe that it is not appropriate to add this Part at this time. The automated vehicle (AV) industry is in its infancy, and much of the technology currently used will likely be obsolete within the next few years, possibly before the 11th edition is even released. Changes of this scale should be deferred until the AV industry has matured, and it is clear both that these vehicles are ready to appear on our roads in significant numbers and that changes to traffic control devices are justified.
- Several of the new requirements for traffic control devices appear to be based on the inadequacy of the current technology rather than on improving the roadway environment for all users. The burden should be on the manufacturer to design an AV that is able to adequately observe and comprehend all traffic control devices that can be understood by a human driver. Examples include:
 - Guidance for LEDs traffic signal indications with a refresh rate greater than 200 Hz to address AV issues with cameras. In order to be safe for operation on urban streets, an AV camera must be able to adequately view any traffic signal indication that is compliant with the current edition of the MUTCD.
 - A requirement for 6" wide lane markings on conventional roadways. This places the burden of the issues with current machine vision technology on those maintaining the road rather than on the manufacturer of the vehicle and significantly increases maintenance costs for agencies that use 4" lines.

Part 9

- **9E.08 Counter-Flow Bicycle Lanes** – The NPA provides a new statement that prohibits the use of counter-flow bike lanes between a general-purpose lane and an on-street parking lane. This prohibition does not appear to be based on any research. The City of Cambridge has three streets with this configuration, one of which has been in operation for over 25 years. We do not have any records of crashes or safety concerns resulting from this configuration on any

of these streets, which are highly used by people bicycling. We recommend that this prohibition be removed from the NPA.

In closing, I would like to thank the staff from FHWA for all their hard work in developing this NPA and taking key steps to improve the document in many ways. Although we—and many other organizations—are requesting significant changes and suggesting that FHWA consider reframing the intent of the document, we also recognize that revisions to MUTCD are complicated and that significant improvements have been made in the draft document. Moving forward, we hope to work collaboratively with FHWA, national organizations, and other municipalities to develop an MUTCD that supports our shared goals related to safety, equity, and sustainability.

Very truly yours,

A stylized, handwritten signature in black ink, consisting of several fluid, connected strokes.

Joseph E. Barr
Director