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## **Federal Highway Administration**

**23 CFR Parts 470, 635 and 655**

**[FHWA Docket No. FHWA-2020-0001]**

**RIN 2125-AF85**

### **National Standards for Traffic Control Devices; the Manual on Uniform Traffic Control Devices for Streets and Highways; Revision**

**AGENCY:** Federal Highway Administration (FHWA), U.S. Department of Transportation (DOT).

**ACTION:** Final rule.

**SUMMARY:** The Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) (also referred to as “the Manual”) is incorporated by reference within our regulations, approved by FHWA, and recognized as the national standard for traffic control devices used on all public roads, bikeways, or private roads open to public travel. The purpose of this final rule is to revise Standard, Guidance, Option provisions, and supporting information, relating to the traffic control devices in all parts of the MUTCD to improve safety for all road users by promoting uniformity, and to incorporate new provisions that reflect technological advances in traffic control device application. The MUTCD, with these changes incorporated, is being designated as the 11th Edition of the MUTCD.

**DATES:** Effective on [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The incorporation by reference of the publication listed in the rule is approved by the Director of the Office of the Federal Register as of [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**FOR FURTHER INFORMATION CONTACT:** Mr. Kevin Sylvester, Office of Transportation Operations, (202) 366–2161, [Kevin.Sylvester@dot.gov](mailto:Kevin.Sylvester@dot.gov), or Mr. William Winne, Office of the Chief Counsel, (202) 366–1397, [William.Winne@dot.gov](mailto:William.Winne@dot.gov), Federal Highway Administration, 1200 New Jersey Avenue, SE, Washington, DC 20590.

**SUPPLEMENTARY INFORMATION:**

**Electronic Access**

This document, the notice of proposed amendments (NPA), and all comments received may be viewed online through the Federal eRulemaking portal at:

[www.regulations.gov](http://www.regulations.gov). Electronic submission and retrieval help and guidelines are available under the help section of the Website. It is available 24 hours each day, 365 days each year. Please follow the instructions. An electronic copy of this document may also be downloaded from the Office of the Federal Register’s homepage at:

[www.federalregister.gov](http://www.federalregister.gov) and the Government Printing Office’s Webpage at:

[www.GovInfo.gov](http://www.GovInfo.gov).

**Executive Summary**

The Department of Transportation is committed to securing a future without serious roadway injuries or fatalities. Our approach is guided by our National Roadway Safety Strategy (NRSS)<sup>1</sup> which was released in January 2022 and adopts the Safe System Approach as the guiding paradigm to address roadway safety. One of the 5 objectives of the Safe System Approach is Safer Roads. There are many factors that go into making a road safe, including the surrounding land use, the geometric design of the roadway, and the uniform and consistent application of traffic control devices. The MUTCD is a set of technical criteria for the latter, and does not preclude action that State, local, or tribal decision makers might take on the first two.

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<sup>1</sup> Information on the NRSS can be viewed at the following Web address: <https://www.transportation.gov/NRSS>.

The MUTCD is part of an overall DOT strategy that includes process and outreach changes. This document will be supplemented by a process improvement to increase the frequency of MUTCD updates to a 4-year cycle, seek a wider range of stakeholders to review and develop recommendations, and include educational components that help practitioners understand the use and applicability of the document.

The FHWA has developed a Proven Safety Countermeasures initiative<sup>2</sup> (PSCi) which identifies countermeasures and strategies effective in reducing roadway fatalities and serious injuries, and strongly encourages transportation agencies to consider implementing tools to improve safety.

This rulemaking satisfies a Congressional requirement that was part of the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law.

## **I. Intended Use**

The MUTCD is developed and organized for the purpose of establishing national standards for traffic control devices on any roadway, bikeway, or shared-use path that is open to public travel. It is not intended to inform State or local policy on the design and character of communities or the geometric design of roadways, to prioritize a travel mode, or to influence land use or access by any mode of travel. Relevant local authorities and roadway owners determine land use, such as transit-oriented development, and roadway design to safely and conveniently prioritize walking, bicycling, public transit, motor-vehicle travel, or a combination of modes. The DOT is committed to securing a future without serious roadway injuries or fatalities and released the NRSS which adopts a Safe System Approach as the guiding paradigm to address roadway safety. As described in the NRSS, roadway design strongly influences how people use roadways.

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<sup>2</sup> Information on the PSCi can be viewed at the following Web address:  
<https://highways.dot.gov/safety/proven-safety-countermeasures>.

The environment around the roadway system, including land use and the intersections of highways, roads, and streets with other transportation modes such as rail and transit, also shapes the safety risks borne by the traveling public. The FHWA has developed the PSCi which identifies countermeasures and strategies effective in reducing roadway fatalities and serious injuries, and strongly encourages transportation agencies to consider implementing tools to improve safety. Following local determination of a roadway design, the MUTCD governs how traffic control devices communicate the design intent to the road user to safely and efficiently navigate the roadway system.

## **II. Purpose of the Regulatory Action**

This final rule is intended to improve safety, with a focus on vulnerable road users, streamline processes, and reduce burdens on State and local agencies by including many of the successful devices or applications that have resulted from nearly 200 official experiments that FHWA has approved, including pedestrian safety enhancements such as the rectangular rapid-flashing beacon, proven treatments that help bicyclists navigate the street more easily such as bicycle signal faces, congestion-reduction strategies such as variable speed limits for speed harmonization, and devices for traffic management applications such as dynamic lane control and shoulder use. In addition, this final rule adopts new signing to direct electric vehicle users to charging stations and the inclusion of numerous treatments for bicycle and transit lanes.

The rule updates the technical provisions to reflect advances in technologies and safety and operational practices, incorporate recent trends and innovations, and set the stage for automated driving systems as those systems continue to take shape. This final rule promotes uniformity and incorporates technological advances in traffic control device design and application, and will ultimately improve and promote the safety, inclusion, and mobility of all road users and efficient utilization of roads that are open to public travel.

With this 11th Edition of the MUTCD, FHWA addresses any existing provisions that might have contributed to situations that inhibit or contravene the purpose of a nationwide standard for traffic control devices. The provisions of the MUTCD establish this national standard by adopting only those devices that, by clearly communicating the roadway design and operational intent to the road user, promote the safety, inclusion, and mobility of all road users and the efficient utilization of the highways and streets through an uninterrupted, uniform system of signs, signals, and markings as road users travel within and between jurisdictions. Uniformity and consistency in message, placement, and operation of traffic control devices have been shown to accommodate the expectancy of the road user, resulting in a more predictable response, contributing to improved road user safety overall. The system of uniform traffic control devices works in concert with the natural tendencies of the road user in the various high-judgment situations that the road user will encounter.

### *Safety*

Uniform traffic control devices are critical to ensuring safety across the roadway network, and are part of the Safe System Approach,<sup>3</sup> adopted by DOT. The Safe System Approach addresses every aspect of reducing crash risks, including safer road users, safer speeds, safer roads, safer vehicles, and safer post-crash care. Traffic control devices influence three of these factors by guiding roadway users toward uniform and predictable behavior; directing roadway users on safe operating speeds; and, in conjunction with roadway infrastructure, separating users in time and space. This approach can prevent crashes and reduce the kinetic energy transfer that can result in human injury or death.

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<sup>3</sup> The Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA), defined the safe system approach as “a roadway design that emphasizes minimizing the risk of injury or fatality to road users; and that (i) takes into consideration the possibility and likelihood of human error; (ii) accommodates human injury tolerance by taking into consideration likely accident types, resulting impact forces, and the ability of the human body to withstand impact forces; and (iii) takes into consideration vulnerable road users.”

In addition, a focus on the safe mobility of vulnerable road users<sup>4</sup> is prominent throughout this new edition and is expected to be a focus in future rulemaking, anticipated to be issued on a quadrennial cycle. Consideration of roadway context as an important factor has informed many of the new provisions wherever practicable. In particular, those applications in which differing roadway environments and road user needs are critical to the decisions on the types of traffic control devices under consideration have been emphasized or expanded upon.

### *Scope and Applicability*

Notwithstanding this focus, it is important for users of the MUTCD to be mindful that its scope is limited to traffic control devices: the signs, signals, and markings, and how they appear, operate, and are used. While its provisions are founded in safety, the MUTCD is not a roadway design manual, nor is it a comprehensive safety manual. The geometric and other design features of the roadway, such as curbs, barriers, intersection corner radii, and number and width of lanes, have a significant influence on safety and, in many cases, road user compliance with the traffic control devices selected. Likewise, it is not a policy or directive on how jurisdictions are to use their roadways to provide for efficient mobility of people and goods through their communities, or which travel modes are to have priority in the overall roadway network. Indeed, nothing in the MUTCD restricts a community from designing walkable, transit-oriented roadways or high-speed highways as that community determines appropriate to serve its needs. Rather, the MUTCD is about directly communicating with the road user, in an effective manner, about how the roadway is intended to be used in the context and constraints of its physical space, design features, and surrounding environment.

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<sup>4</sup> Title 23 of the United States Code (23 U.S.C.) section 148(a), Highway Safety Improvement Program, states a “vulnerable road user” means a non-motorist.

With its human-centered foundation, the MUTCD has always been about the road user; establishing uniformity in message to accommodate expectancy and behavior, informed by the body of knowledge based on decades of human factors research, to provide for the safe and efficient mobility. Reflecting our changing environment, that research basis continues to expand and evolve as new trends and applications emerge. While strictly a technical manual, the primacy of the road user is at the heart of the MUTCD's many technical provisions. The changes adopted in the new edition seek to emphasize the importance of the road users—each with varying capabilities and limitations, traveling by different modes—in the design and application of traffic control devices.

Finally, with this final rule, FHWA fulfills certain statutory requirements of the Bipartisan Infrastructure Law (BIL), enacted as the Infrastructure Investment and Jobs Act (IIJA), which explicitly calls for a new edition of the MUTCD to be issued in a timely manner and be updated on a quadrennial cycle, as well as a number of specific items related to the MUTCD.

### **III. Summary of the Major Provisions of the Regulatory Action in Question**

Key items in this final rule include the following:

Incorporation of provisional traffic control devices currently under Interim Approval, including pedestrian-actuated rectangular rapid-flashing beacons at uncontrolled marked crosswalks, green-colored pavement for bicycle lanes, red-colored pavement for transit lanes, and a new traffic signal warrant based on crash experience;

Improvements to safety and accessibility for pedestrians, including the location of pushbuttons at signalized crosswalks, crosswalk marking patterns, and accommodations in work zones;

Expanded traffic control devices to improve safety and operation for bicyclists, including intersection bicycle boxes, two-stage turn boxes, bicycle traffic signal faces, and a new design for the U.S. Bicycle Route sign;

Additional signing options for direction to electric vehicle charging services;

Considerations for agencies to prepare roadways for automated vehicle technologies and to support the safe deployment of automated driving systems;

Clarifications on patented and proprietary traffic control devices to foster and promote innovation; and

Safety and operational improvements, including revised procedures for the posting of speed limits, new criteria for warning signs for horizontal alignment changes, and new application of traffic control devices for part-time travel on shoulders to manage congestion.

In addition, this regulatory action amends the following:

23 CFR part 470, Subpart A, Appendix C;

23 CFR 635.309(o);

23 CFR 655.603(b)(3); and

23 CFR 655.603, Appendix to Subpart F

#### **IV. Costs and Benefits**

The FHWA has estimated the costs and evaluated potential benefits of this rulemaking and believes the rulemaking is being proposed in a manner that fulfills the requirements under 23 U.S.C. 109(d) and 23 CFR part 655, while also providing flexibility for State and local agencies. The estimated national costs are documented in the economic analysis report titled, “Assessment of Economic Impacts of Amendment to the Manual on Uniform Traffic Control Devices (11th Edition); Final Rule Economic Impact Assessment,” which is available on the docket.



The final rule results in clarification of language and organization of the MUTCD, increased flexibility and alternatives for agencies, relaxation of certain Standard provisions to Guidance, and the introduction of new traffic devices. For the purposes of this analysis, where revisions improve the clarity of existing content, those revisions have been considered non-substantive. All other revisions are considered substantive as they materially change the requirements of the MUTCD.

The Economic Impact Analysis provides estimates of general administrative costs associated with incorporating and executing the MUTCD including training costs. Second, the incremental costs associated with revisions to provisions of the MUTCD are calculated.

This final rule provides quantitative estimates of the expected compliance costs associated with the proposed substantive revisions. There are 138 substantive revisions with minimal or no impact. These revisions materially change the MUTCD requirements but have no cost impacts or minimal cost impacts.

The remaining nine substantive revisions have quantifiable economic impacts. The costs of the revision could be estimated fully for only five of these, and partially for one other. Across these six substantive revisions for which costs can be quantified, along with the administrative costs, the total estimated cost measured in 2020 dollars is \$59.7 million when discounted to 2020 at 7 percent. These costs are estimated as the sum of the effort required for adoption and training of the MUTCD, the price of the traffic control device and the removal and installation costs of the device, applied to the current and future deployment rate of the traffic control device, considering the compliance date for the provision relating to the device. The revisions differ in their compliance dates, the date after which the traffic control devices must comply with the MUTCD revisions. The cost estimates reflect whether the revision includes a compliance date. For those changes for which a compliance date is not specified, the analysis assumes that agencies would

make traffic control devices comply with the revisions at the end of the service life of a device while, for those with a compliance date, the analysis assumes that agencies would bring non-compliant traffic control devices into compliance proportionally each year until the compliance date. The analysis cannot account for agencies that might decide to set their own compliance dates for those items that do not have a compliance date in the national MUTCD. The analysis period is 10 years starting with an implementation date of 2023 and extending through 2032. The costs of four substantive revisions could not be estimated due to lack of information, but all are expected to have net benefits based on per-unit or per-mile costs and benefits of the proposed revision. Costs for each substantive revision with appreciable impacts are estimated based on the cost of the traffic control device, the removal and installation costs of the device, the current and future deployment of the traffic control device, and the compliance date if applicable.

The benefits of the revisions include operational and safety benefits. Operational benefits include the capacity of the traffic control device to convey necessary information to road users, accessibility benefits for pedestrians with vision disabilities, and mobility impacts from efficient operation. In some cases, the safety benefits are measured by the revision's impact on crash surrogate measures because of the limitations of analyzing the direct impact of traffic control devices on crash rates. However, in most cases the impact on crash surrogate measures does not provide an expressed crash reduction capability of the traffic control. Therefore, the benefits of these revisions could not be quantified.

For each substantive revision with measurable costs, FHWA expects that the benefits will exceed costs. Based on the qualitative and quantitative information presented, FHWA expects that, in general, the potential benefits of the rulemaking will exceed its costs.

## **Background**

On December 14, 2020, at 85 FR 80898, FHWA published a Notice of Proposed Amendments (NPA) proposing revisions to the MUTCD. Those changes were proposed to be designated as the next edition of the MUTCD. Interested persons were invited to submit comments to FHWA Docket No. FHWA-2020-0001.

After the close of the public comment period, the President signed into law the BIL, enacted as the IIJA, (Pub. L. 117-58, Nov. 15, 2021). Section 11129 of BIL amended 23 U.S.C. 109(d) to require that a new edition of the MUTCD be issued not later than 18 months after the enactment of BIL, and every 4 years thereafter; and to articulate more explicitly the role of traffic control devices, which is to “promote the safety, inclusion, and mobility of all users and efficient utilization of the highways.”

Section 11135 of BIL required that the MUTCD be updated, to the greatest extent practicable, to provide for the protection of vulnerable road users; the safe testing of automated vehicle technology and safe integration of automated vehicles onto public streets; appropriate use of changeable message signs (CMS) to enhance safety; the minimum retroreflectivity of traffic control devices, including pavement markings; and any additional recommendations made by the National Committee on Uniform Traffic Control Devices (NCUTCD).

In this final rule, FHWA takes steps to fulfill certain requirements of BIL. For example, the adoption of rectangular rapid-flashing beacons and bicycle signal faces will improve the safety of vulnerable road users; a completely new part of the Manual is dedicated to traffic control devices to accommodate driving automation systems; the provisions on CMS are greatly expanded to address traffic safety messages with more clarification and detail; and FHWA published a final rule<sup>5</sup> on August 5, 2022, at 87 FR 47921, establishing minimum retroreflectivity levels for pavement markings.

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<sup>5</sup> Designated as Revision 3 of the 2009 Edition of the MUTCD.

Based on the comments received and its own experience, FHWA is issuing a final rule and is designating the MUTCD, with these changes incorporated, as the 11th Edition of the MUTCD.

The text of the 11th Edition of the MUTCD, with these final rule changes incorporated, and documents showing the adopted changes from the 2009 Edition, are available for inspection and copying, as prescribed in 49 CFR part 7, at the FHWA Office of Transportation Operations (HOTO-1), 1200 New Jersey Avenue, SE., Washington, DC 20590. Furthermore, the text of the 11th Edition of the MUTCD, with these final rule changes incorporated, and documents showing the adopted changes from the 2009 Edition, are available on the FHWA's MUTCD Internet site <http://mutcd.fhwa.dot.gov>. The previous edition of the MUTCD, the 2009 MUTCD with Revisions 1, 2, and 3 incorporated, is also available on this Internet site for reference. The 11th Edition supersedes all previous editions and revisions of the MUTCD.

### **Summary of Comments**

The FHWA received more than 17,000 submissions to the docket, containing over 100,000 individual comments on the MUTCD in general or on one or more parts, chapters, sections, or paragraphs contained in the MUTCD. The State departments of transportation (State DOT), city and county government agencies, Federal Government agencies, NCUTCD, consulting firms, private industry, associations, other organizations, and individual private citizens submitted comments. The FHWA has reviewed and analyzed all comments received. The significant items and summaries of the associated public comments, and FHWA's analyses and determinations, are discussed below. In addition to the following discussion, Preamble Tables that show the proposed items in the NPA and the dispositions in the final rule for each are available on the MUTCD Website and in the docket for this rulemaking.

### **Discussion of Amendments to the MUTCD**

The following represents a summary of significant topics of interest identified based on comments received from State DOTs, local agencies, associations, and citizens regarding the NPA. These items are summarized by corresponding parts of the MUTCD.

***Part 1. General***

*Compliance Dates*

Compliance dates for four provisions are adopted in this final rule. The compliance dates are summarized in Table 1B-1 of the MUTCD and are described in detail herein. In addition, one compliance date from a previous rulemaking<sup>6</sup> remains in effect.

In Section 2B.64, Paragraph 14 requires that an additional Weight Limit sign, with an advisory distance or directional legend, shall be located in advance of the applicable section of highway or structure so that prohibited vehicles can detour or turn around prior to the limit zone. The NPA proposed changes to give operators of vehicles affected by weight limit restrictions adequate information about the distance to the restricted area so that they can properly change their route and to minimize potential damage to highway infrastructure as a result of an overweight vehicle; however, there was no compliance date proposed for these changes. Based on comments and to provide further clarity in this final rule, the two separate paragraphs from the 2009 edition are retained but the proposed elevation of the Guidance to a Standard is adopted with added text to clarify that the first Standard relates to posting at the applicable section of highway and structure, rather than in advance. The FHWA adds a compliance date of 5 years for the Standard in Paragraph 14 requiring the posting of the additional Weight Limit sign with the advisory distance or directional legend. The FHWA believes a 5-year compliance date is appropriate based on the critical nature of the infrastructure in that it

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<sup>6</sup> 87 FR 47921.

allows agencies up to 2 years to adopt the MUTCD and 3 additional years for agencies to program, fund, and install any devices necessary

In Section 2C.25, based on comments from the NTSB, the Standard which redesignated the W12-2 sign as an advance sign is adopted with revised language to warn road users of vertical clearances less than 14 feet 6 inches, or vertical clearances less than 12 inches above the statutory maximum vehicle height, whichever is greater. All States have statutory maximum vehicle heights of 13 feet 6 inches or greater, thus making the 12 inches above the statutory maximum vehicle height the prevailing criterion. However, in the interest of clarity and safety, the specific language for clearances less than 14 feet 6 inches is added to make it abundantly clear that signing for lesser vertical clearances is required. Further, the use of the existing W12-2a and new W12-2b signs is adopted as an Option to supplement, rather than be used in lieu of, the advance warning sign. The FHWA also adopts the Guidance as proposed in Paragraph 8 which recommends that for an arch or other structure under which the clearance varies greatly, two or more Low Clearance Overhead (W12-2a or 12-2b) signs should be installed on the structure itself to indicate the portions of the roadway over which the low clearance applies. This change was based on recommendations from NTSB H-14-11<sup>7</sup> to provide signing indicating the proper lane of travel for overheight vehicles traveling under an arched structure. The FHWA received comments relating to the proposed compliance dates for a guidance statement and confusion about the applicability based on the structure type. In this final rule FHWA clarifies their applicability to arch or similar type varying height structures and the application of a compliance date when a sign is not required, in the case of the recommendation for posting in Paragraph 8. Based on the critical nature of the infrastructure, FHWA adopts a compliance date of 5 years for both Paragraph 1 (required posting of the low clearance in advance of the structure) and Paragraph 8 (recommended

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<sup>7</sup> <https://www.nts.gov/investigations/AccidentReports/Reports/HAR1401.pdf>

posting of variable low clearances on the structure, unless determined based on engineering considerations that the recommended posting is not needed at that location).

In a previous and separate rulemaking, a standard for the minimum level of retroreflectivity that must be maintained for pavement markings was established along with a compliance date which became Revision 3 to the 2009 edition of the MUTCD. As a result, FHWA incorporates the provisions from that completed rulemaking into Section 3A.05. The compliance provision is only for implementation and continued use of a method that is designed to maintain retroreflectivity of longitudinal pavement markings, and the compliance date is September 6, 2026.

The NPA included a compliance date of 5 years for the new Guidance in Section 8B.16 recommending the installation of Low Ground Clearance and/or Vehicle Exclusion and detour signs for vehicles with low ground clearances that might become immobilized or hung up on high-profile grade crossings due to their undercarriages being too low to clear the roadway profile at the track crossing. The proposed compliance date applied only to those locations with known histories of vehicle hang-ups occurring, because sufficient geometric criteria do not currently exist for agencies to evaluate crossings to determine the specific types of vehicles that could experience hang-up situations. Comments on this section acknowledged the value of detour signing for low clearance vehicles in certain cases but suggested there are too many variables in terms of geometric conditions and the types of vehicles and vehicle combinations to adequately identify the risk of these vehicles hanging up at a grade crossing. There were also comments that suggested signing for all vehicles that could potentially hang up at crossings would result in excessive signing and driver confusion. There were also comments about the proposed compliance date, suggesting instead that devices should be brought into compliance through routine maintenance operations. Despite the challenges, FHWA acknowledges the need, as recommended in the National Transportation Safety Board (NTSB)

recommendation H-18-024, to provide guidance to agencies to help identify and address high-profile crossings, especially those that are known from past experience to be subject to specific vehicle type hang-ups. The text provides Guidance and Support to assist agencies in addressing these situations through signing. The compliance date applies to known potential vehicle hang-up locations that are currently identified by agencies through their grade crossing inventory. The FHWA adopts the Guidance and Support statements as proposed, including compliance dates.

The NPA included a compliance date of 10 years for evaluation and installation of appropriate treatments), including preemption, movement prohibition, pre-signals, or queue cutter signals, for highway traffic signals located at or near grade crossings. Commenters indicated that the costs to evaluate and implement these treatments at highway traffic signals can be significant and may not align with the agency's other priorities. Commenters also pointed out that the number of impacted locations varies greatly by State creating a significant challenge for some States to meet the proposed compliance date. Comments suggested that devices should be brought into compliance through the systematic replacement and upgrade of traffic control devices and not subject to a compliance date. This final rule adopts the compliance date for Sections 8D.09 through 8D.12 with revisions to require only an assessment and determination of appropriate treatment to reach compliance at specific locations. Agencies will be granted flexibility to determine the schedule for installation of improvements based on availability of funding and other safety priorities through the systematic replacement and upgrade of traffic control devices as currently prescribed in the MUTCD for other traffic control devices.

#### *Experimentation*

The FHWA recognizes the importance of innovation in traffic control devices for the improvement of traffic safety and operations, particularly for vulnerable road users



and automated vehicles. The FHWA, in this final rule, greatly expands this section in a number of areas to better help practitioners in preparing experimentation plans. In the NPA, FHWA proposed to create a new section specifically related to experimentation, now Section 1B.06 (formerly part of Section 1A.10 in the 2009 MUTCD), with Standard, Support, and Guidance paragraphs describing the experimentation process, which provides for evaluation of new traffic control devices or applications under controlled conditions. As part of those changes, FHWA clarified the existing paragraph regarding the elements to be provided in an agency's request for experimentation from a Guidance to a Standard, and expanded the requirements, including specification of the timing of submitting semi-annual progress reports documenting the approved experiments.

Many commenters supported the need for experimentation and thoughtful process associated with it to provide uniformity and safety for road users; however, many commenters stated that they believe the experimentation process is getting more complicated. Commenters suggested that the existing process hinders innovation to the point of it becoming impossible to pursue due to the steps and time required. As a result, some agencies stated that resource restrictions prevent them from engaging in experimentation and therefore only a handful of States/agencies can afford to experiment. Several organizations and State and local departments of transportation suggested FHWA retain the experimentation process as Guidance, as opposed to Standards, and simplify it. Several commenters also suggested that the requirement for devices to be free from protection by patents, trademarks, etc. is overly burdensome and stifles innovation. They suggested that FHWA allow targeted patented and proprietary products to be used in the experimentation process without patent holders having to forfeit their proprietary protections and allow FHWA to consider these products based on their safety impacts, rather than having them precluded from the experimentation process before their benefits are known. Other comments ranged from allowing agencies to use engineering

judgement to determine the appropriate course of action without making a request for experimentation to allowing the default assumption that experimentations may stay in place beyond the end of the experimentation period unless FHWA determines that the experimentation has created an unacceptable safety or operational issue. There were also several comments about the experimentations themselves, including the requirement for control sites, and the desire to coordinate research resources to support local agencies with data collection efforts and research partnerships.

In consideration of the comments, FHWA adopts a new Option to streamline the process for requesting official experimentation. This new Option allows a requesting agency to submit an abstract of the experimental concept for preliminary review of its viability and potential alignment with other ongoing or previous research on the concept. The FHWA frequently engages with agencies prior to submission of an official request, and the new Option should reduce burdens on agencies by deferring or eliminating the need to develop a full research plan in the event that FHWA identifies a solution that complies with the MUTCD.

An agency will sometimes submit a request for experimentation with a new device or application to address a need that, instead, could be addressed with devices that comply with the MUTCD. If an existing compliant solution is identified, the need for experimentation to develop and consider a new device or application is eliminated. To further assist agencies in preparing requests for experimentation, clarifying language is added stating that if one of the required items is not applicable for the specific device or application, those items are required to be addressed in the request with a brief explanation as to their non-applicability. The FHWA adopts this change to confirm that each of the required items has been addressed, even if some of the items do not apply to the particular type of experimental device or application or based on the evaluation methodology.

The FHWA retains the Standard requiring official approval to experiment with a traffic control device that does not comply with the provisions of the MUTCD on any street, highway, bikeway, or site roadway open to public travel. This Standard is a clarifying statement of the existing process that is necessary to limit use of non-compliant devices or applications and minimize any safety risk from experimental features, help ensure that experiments contain adequate provisions to determine effectiveness, and provide national documentation of results. The experimentation process ensures that efforts to solve safety or operational problems with new traffic control devices employ objective, data-driven approaches rather than subjective, anecdotal, or stochastic approaches that could result in unintended adverse effects. The FHWA understands that the experimentation process is of concern due to the level of analysis required, which can take time and financial resources. However, the MUTCD is the national standard for traffic control devices; therefore, deviation requires specific permission through experimentation approval. It is important to understand that nothing about the experimentation process prevents States or local communities from making decisions regarding the geometric design or land use pattern of a community for any reason, including to improve safety for vulnerable road users. The parameters regarding experimentation are intended to help ensure the experimental application does not introduce unintended risk or confusion into the transportation network due to noncompliant traffic control devices or applications. The type and level of analysis associated with experimentation helps ensure experimentation provides useful information for later decisionmaking on additional research, potential revisions to the MUTCD, or advancement of a concept through Interim Approval pending rulemaking. Therefore, the required basic elements for all experiments do not change though the specifics of how they are applied vary by the device being evaluated and the context of its use. In many cases, simple experimentation provisions can fully address the necessary

basic requirements and often in ways that are not prohibitively expensive. For example, field evaluation of a new device intended to improve motorist yielding at crosswalks might require only simple vehicle yielding counts by a trained observer at various intervals over a period of time to compare conditions before and after implementation. The cost of experimentation is completely dependent on the type of analysis needed to adequately evaluate the device or application.

The FHWA retains the existing MUTCD prohibition on patented or proprietary traffic control devices, including under experimental consideration, and adds language to clarify that this provision is actually a limitation that applies to traffic control devices, but not necessarily to certain aspects of those devices, such as their component parts. The FHWA has sufficient rationale for precluding patented devices in the MUTCD, including a long-standing history of uniformity issues when patented devices were used on roadways. Given that the purpose of experimentation is to test devices or applications for national applicability and potential or eventual inclusion in the MUTCD, allowing patented devices into the experimentation process would serve no purpose because eventual inclusion of a device into the MUTCD would still require relinquishing those rights. Further clarification on the extent to which the MUTCD limits and allows patented items is provided in Section 1D.06.

The FHWA also retains the existing provision subjecting experimental traffic control devices to removal following the conclusion of the experiment. Requiring the removal of experimental devices after an experiment has ended when those devices are not being considered for adoption in the MUTCD is necessary for consistency with the MUTCD being the national standard for traffic control devices, with non-compliant devices only being allowed during experimentation. Experimental devices that are shown to be sufficiently effective based on appropriate levels of experimentation are sometimes issued an Interim Approval official ruling and then become available for use by all

agencies requesting their use. Experimental devices that lead to Interim Approvals are generally allowed to remain in place after the experimentation period during the Interim Approval issuance process.

Control sites, which are sites with similar characteristics to the experimentation site but without the experimental treatment itself, are typically considered essential for scientifically sound research on traffic control devices, as they allow for comparison of data to minimize the effects of variables that are not part of the study. However, FHWA agrees that for certain types of device evaluations or applications control sites may not be necessary to ensure sound research results. The FHWA therefore revises that requirement to allow for other equivalent evaluation methodologies to be used. In addition, a clarifying support statement is added allowing a single experimentation request from multiple jurisdictions wanting to experiment with the same device. Similarly, jurisdictions can potentially be added to an approved existing experiment underway by a different jurisdiction, thereby reducing the time and expense in experimenting with a device. This approach differs greatly from Interim Approval, as the sites in the added jurisdictions are required to be evaluated under the same experimentation plan.

Lastly, FHWA is developing experimentation guidelines separate from the MUTCD that will provide helpful direction in planning, submitting, and evaluating an MUTCD experiment with traffic control devices. The experimentation guidelines will include background information on research, how to find assistance, and practical examples of device experimentation across different levels of complexity. In response to noted concerns, the guidelines will seek to streamline understanding of experimentation with traffic control devices, as well as reduce financial or institutional barriers that local agencies, in particular, might experience in this area. This document is currently in development and will be published after the completion of this rulemaking.

## *Engineering Study and Engineering Judgment*

In proposed Section 1D.05 (now Section 1D.03), FHWA proposed to provide new Standard, Guidance, and Support paragraphs to supplement existing Guidance and Support. The new text is based on FHWA Official Ruling No. 1(09)–1 (I)<sup>8</sup> and clarifies the application of engineering study and engineering judgment to the selection and specification of traffic control devices for implementation. Among the areas covered are the extent to which the specialized training and experience of an engineer are involved in traffic control device decisions and activities, and the authority of a jurisdiction or agency to make and implement those decisions, for the purpose of ensuring that facilities open to public travel meet a high level of safety that the public expects.

The changes clarify the role of trained engineers as important advisors whose engineering studies are valuable inputs in the overall decisionmaking process. Several commenters expressed concern over the definitions of engineering judgment and engineering study, indicating that others besides engineers or those under the supervision of an engineer should be allowed to make decisions about traffic control device application and activities.

The primary concern expressed was that small public agencies may not have staff that meets these requirements and therefore should be allowed to make those types of decisions regardless of engineering oversight. In response to these concerns, FHWA adopts the proposed language with minor edits noting that the text does not require every traffic control device decision to be made by an engineer or be made under the supervision of an engineer. However, decisions requiring engineering judgment and engineering study do require the specialized training and experience of an engineer, or someone acting under the supervision or direction of an engineer, to ensure the public

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<sup>8</sup> FHWA's Official Ruling No. 1(09)-1 (I) can be viewed at the following Web address: [https://mutcd.fhwa.dot.gov/resources/interpretations/pdf/1\\_09\\_1.pdf](https://mutcd.fhwa.dot.gov/resources/interpretations/pdf/1_09_1.pdf).

facilities meet a high level of safety expected by the public for clarity, comprehension and legibility of message, as well as uniformity of application of traffic control devices in similar situations. The selection, design, and application of traffic control devices are inherently engineering functions. Traffic control device activities, such as installing and maintaining traffic control devices, are engineering functions conducted in accordance with plans, specifications, or other functions developed by and under the supervision or direction of an engineer. Engineers have a specific level of responsibility and accountability under professional licensure and are subject to a professional board and code of ethics. When necessary, there are many ways in which local communities are able to obtain engineering guidance including, but not limited to, the use of consultants and local transportation assistance type programs (Local Technical Assistance Program,<sup>9</sup> or similar). Other resources, such as handbooks and field installation manuals, are available for select traffic control activities for which the direct supervision of an engineer might not be necessary. Such resources are developed by an engineering organization and adopted by the State or county transportation agency for use on roadways within their boundaries, including for local roadways.

To further clarify the intent of the provisions, FHWA adopts additional language to explain that the MUTCD does not mandate, and is not intending to imply, that an engineer must make the final decision whether to implement or execute the determination or advice of an engineer by installing or constructing the traffic control device to the engineer's specification in the field. Rather, the engineer, individual under supervision or direction of an engineer, or other individual as duly authorized by State law to engage in the practice of engineering, develops an engineering-based solution that includes the specifications for selection and placement of traffic control devices. The responsibility

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<sup>9</sup> Information about LTAP can be found at FHWA's Local Aid Support site at the following Web address: <https://www.fhwa.dot.gov/clas/ltap/>.

for a final decision to implement traffic control solutions rests with the agency (or owner) having jurisdiction over the roadway, after consultation with and based on advice from the engineer, to ensure that the design and operational intent of the facility are safely and effectively conveyed to road users. In many cases, it might be an engineer to whom the agency has delegated that authority. In other cases, such as with smaller agencies or owners of private roads open to public travel, it is the roadway owner that makes the decision on implementation, similarly following consultation with an engineer on the selection, design, and application of the specific traffic control device at the specific location to communicate safely and effectively with the road user.

In the final rule, the section is renumbered to Section 1D.03.

## ***Part 2. Signs***

### ***Speed Limit Setting***

Speed control and management are important elements in reducing fatalities and serious injuries, particularly on roadways where vehicles and vulnerable road users mix. States and local jurisdictions should set appropriate speed limits to reduce the significant risks drivers impose on others, vulnerable road users, and on themselves. In the NPA, FHWA proposed to reorganize and revise material in Section 2B.21 (formerly 2B.13 of the 2009 MUTCD) Speed Limit Sign (R2-1) based on the recommendation of the NTSB<sup>10</sup> to review how speed limits are determined. The NPA proposed to clarify the factors that should be considered when establishing or reevaluating non-statutory speed limits within speed zones, and to reinforce that other factors, in addition to the 85th-percentile speed,<sup>11</sup> have a role in setting speed limits.

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<sup>10</sup> NTSB report “Reducing Speeding-Related Crashes Involving Passenger Vehicles,” can be viewed at the following Web address: [www.nts.gov/safety/safety-studies/Documents/SS1701.pdf](http://www.nts.gov/safety/safety-studies/Documents/SS1701.pdf)

<sup>11</sup> 85th-Percentile Speed is the speed at or below which 85 percent of the motor vehicles travel, which is sometimes used to provide an indication of the free-flow operating speed the roadway for determining traffic control device applications.



Speeding is one of the largest and most persistent contributing factors in fatal traffic crashes, resulting in nearly 100,000 fatalities over the past decade.<sup>12</sup> The DOT's NRSS adopts a Safe System Approach which includes a focus on Safer Speeds as a core tenet and recognizes that achieving safe speeds requires a multi-faceted approach that leverages road design and other infrastructure interventions, speed limit setting, education, and enforcement.

Over the past several editions, FHWA has sought opportunities to reduce the amount of superfluous or duplicative content for purposes of streamlining the MUTCD and improving its usability, especially when that content is outside the scope of the MUTCD, which is the appearance, operation, and other aspects of traffic control devices—signs, signals, and markings. A number of commenters suggested that the MUTCD should not contain procedures on how to set speed limits, and that it is beyond its scope. The FHWA will assess the viability of removing the speed limit setting provisions from the MUTCD in a future rulemaking. This topic is discussed in more detail later in this section.

A large number of comments on the setting of speed limits were received from organizations, public jurisdictions, and individuals. Many comments were based on a presumption that speed limits are required to be set at the 85th-percentile speed. However, this presumption is inaccurate. There is no existing or new requirement that a speed limit must be set at the 85th-percentile speed. The MUTCD allows for roadway owners and engineers to consider a wide variety of other factors in the engineering study including road characteristics, roadside development and environment, pedestrian activity, parking, and crash experience. All these factors (including speed distribution) are analyzed as part of the required engineering study and it is through that

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<sup>12</sup> National Highway Traffic Safety Administration, Speeding Traffic Safety Facts 2021 Data, report DOT HA 813 473, July 2023: <https://crashstats.nhtsa.dot.gov/#!/PublicationList/82>.

comprehensive analysis that the appropriate speed limit is determined. Further, the MUTCD addresses only non-statutory speed limits. The MUTCD does not preclude States or localities from passing laws to set statutory speed limits. Comments varied broadly in scope and with recommendations that were sometimes conflicting in nature. For example, some commenters recommended completely removing the 85th-percentile speed as a factor to consider in an engineering study and instead requiring the Safe System approach. Others recommended retaining the 85th-percentile speed as a factor because it is a relevant data point that can be important as an indicator that other modifications or speed management strategies might be needed to achieve compliance or some level of a self-enforcing road or street design. Still other commenters suggested removing all material relating to speed limit setting from the MUTCD.

The FHWA is in general agreement with removing provisions from the MUTCD that fall outside its scope, particularly when that information can be found in another source. As mentioned earlier, FHWA has sought opportunities to reduce certain content for purposes of streamlining the MUTCD and improving its usability. The NPA did not propose complete removal of all speed limit setting material as, at this time, there is not an authoritative alternative document on this topic to which practitioners could be directed. Removal of this information under the current rulemaking would leave practitioners without a comprehensive, updated, data-driven reference from an authoritative source outside the MUTCD, as well as potential gaps in available information. (Development of such a comprehensive guide for speed limit setting is in progress and is discussed later in this section.) Therefore, in this final rule FHWA retains provisions on setting non-statutory speed limits in Section 2B.21 but with updates and revisions to state the entire range of factors, recommended for consideration in the engineering study to set a speed limit. In addition, the revised provisions clarify the role

of speed distribution in the engineering study in differing roadway contexts and environments.

The NPA solicited comments on two specific recommendations of the NTSB report: (1) the removal of the 85th-percentile speed as a consideration in setting non-statutory speed limits and (2) a requirement to use an expert system to validate a speed limit that has been determined through engineering study. Commenters were also requested to address likely outcomes if one or more of the other recommendations in the report, such as increased automated enforcement, were not implemented in conjunction with the speed-setting recommendations outlined in the report. Very few commenters addressed these questions directly, but many commenters incorporated their views on the first question especially into their overall comments on the NPA language in Section 2B.21, as described earlier. The FHWA reviewed and considered all comments on Section 2B.21 in making the determinations for this final rule that are described herein.

Safety is the DOT's priority. In furtherance of improving safety, in consideration of the comments received, and to further FHWA's statutory obligation under Section 11135 of BIL to provide for the protection of vulnerable road users, FHWA adopts the proposed NPA change to remove speed distribution from the existing Standard and instead include it in the Guidance provision among the recommended factors for the engineering study. The FHWA also adopts in this Standard a requirement that roadway context be considered in setting speed limits. The updated Guidance provision provides details on six factors to consider in engineering studies on setting speed limits, including roadway environment, roadway characteristics, geographic context, crash experience, speed distribution, and analysis of speed trends. This change clarifies that the engineering study is not just limited to the speed distribution and that the context of the roadway is part of the study. The Guidance also clarifies that on urban and suburban

arterials and rural main streets, the 85th-percentile speed should not be used as the sole consideration in setting speed limits.

The FHWA emphasizes that there is no existing or new requirement that a speed limit must be set at the 85th-percentile speed. Rather, the 85th-percentile speed is included as one of the factors, as referenced in the preceding paragraph, recommended for consideration as a meaningful data point within the engineering study and is a potential indicator that other modifications or speed management strategies might be needed to achieve compliance or some level of a self-enforcing design. This aspect of the engineering study is critical because, just as speed limits need to reflect the road design, the road design similarly needs to reflect the desired operating speed. The FHWA also emphasizes that the relative weight given to each of the recommended factors in the engineering study will depend on the context of the location under study and that the MUTCD does not prioritize any one factor over another.

The FHWA revises the Guidance provision to provide additional flexibility in applying the factors that should be considered in the required engineering study. Also, FHWA adds the 50th-percentile (median) speed as recommended for consideration along with the 85th-percentile speed, because speed limits set below the 50th-percentile speed tend to encourage excessive violations and an analysis of both data points is appropriate as part of an engineering study. The FHWA adds Guidance for agencies to consider measures other than traffic control devices to help achieve desired vehicle operating speeds, when the 85th-percentile speed is appreciably greater than the posted speed limit or where past speed studies have indicated consistent increases in operating speeds. These measures include changes to geometric features and other speed-reduction countermeasures.

The FHWA retains the proposed Guidance provision recommending, but not requiring, that the speed limit be set within 5 mph of the 85th-percentile speed only on

freeways and expressways, and on rural highways outside urban areas or urbanized conditions, as these are the types of facilities where the other factors (such as vulnerable road users) generally do not exist such that this Guidance is appropriate. As Guidance, this provision provides sufficient flexibility to apply unique engineering considerations that might exist; however, FHWA provides additional context by describing this applicability when all factors described in Paragraph 7 have been considered and determined to be non-mitigating or are not present and the factors described in the new Guidance Paragraph 8 have been considered. In addition, FHWA clarifies that factors other than speed distribution should be considered during an engineering study when setting a non-statutory or posted speed limit, depending on the site conditions of the specific location.

The FHWA introduces new Support information at the beginning of the section that discusses applying the provisions to set appropriate speed limits on non-limited access facilities where vehicle operators are more likely to encounter other road users, such as pedestrians and bicyclists, as well as clarify the application of expert systems and the Safe System approach.<sup>13</sup> The new Support provision clarifies that a range of factors can influence the speed limit determined in the engineering study. These factors include land-use context, pedestrian and bicyclist activity, crash history, intersection spacing, driveway density, roadway geometry, roadside conditions, roadway functional classification, traffic volume, and observed speeds. The engineering study will determine which of the recommended factors will prevail in setting the appropriate speed limit and the new provisions are intended to ensure that practitioners consider all road users when setting a speed limit. The FHWA believes that the changes adopted as described herein will result in improved safety through the setting of speed limits that more appropriately reflect their environment and the mix of road users.

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<sup>13</sup> <https://highways.dot.gov/safety/zero-deaths>

To support and better emphasize the importance of roadway context in speed limit setting, FHWA is coordinating as a separate effort the development of a new, comprehensive Speed Limit Setting document to assist practitioners with information on the available tools and how factors for consideration can be used as part of the engineering study in setting a non-statutory speed limit. In conjunction with this effort, FHWA will assess the viability of removing the speed limit setting provisions from the MUTCD and will consider such a revision for a future rulemaking.

### *Electric Vehicles and Alternative Fuels*

In the NPA, FHWA proposed several revisions related to signing for electric vehicle (EV) charging and alternative fuels using General and Specific Service signs. General Service signs display words or symbols to eligible motorist services available along a freeway, expressway, or conventional road. Eligible services include food, gas, EV charging, lodging, camping, public telephone, hospital, or tourist information. Specific Service signs are display specific business identification logos of eligible of commercial motorist services available along a freeway or expressway. Business identification logos are grouped by eligible service category; eligible service categories for Specific Service signs are gas, EV charging, food, lodging, camping, and attractions. Both General Service and Specific Service signs used on freeways and expressways require trailblazing signs providing directional information from an exit ramp all the way to the service site when the service is not visible from the exit ramp intersection with the crossroad.

Alternative Fuels Corridor signs inform road users of the highway segments that have been designated by FHWA as “Corridor Ready,” and use either General Service or Specific Service signs in advance of each interchange or intersection for the fuel service along that corridor. Eligible fuel services for Alternative Fuels Corridors are electric vehicle charging, compressed natural gas, liquefied natural gas, liquid propane gas, and

hydrogen. The FHWA proposed to incorporate information related to EV charging and parking signing based on FHWA’s Memorandum on Regulatory Signs for Electric Vehicle Charging and Parking Facilities.<sup>14</sup> The FHWA also proposed to incorporate technical provisions based on FHWA’s Policy Memorandum, “MUTCD-Signing for Designated Alternative Fuels Corridors,” issued December 21, 2016.<sup>15</sup> The market for alternative fuel vehicles and specifically EVs has evolved significantly in recent years, as has the demand for such vehicles and their corresponding fueling/charging infrastructure. Comments on the NPA reflected this shift and focused on signing for EV charging services and Alternative Fuels Corridors by requesting additional flexibilities to include EV charging services on Specific Service Signs and EV charging supplemental messages on business identification (logo) sign panels for other types of services.

The FHWA agrees with these comments and is adding several provisions to the MUTCD to ensure adequate flexibility is available to sign for EV charging services and Alternative Fuels Corridors. For Alternative Fuels Corridors, FHWA adds technical provisions from FHWA’s Policy Memorandum, “MUTCD-Signing for Designated Alternative Fuels Corridors,” to the MUTCD in Chapter 2H, Section 2H.14. The provisions establish the Alternative Fuels Corridor signs in the MUTCD and clarify use of General Service Signs and directional assemblies to guide motorists to EV charging services. The final rule also includes new figures in MUTCD Section 2H.14 showing typical sign layouts along an Alternative Fuels Corridor and the use of EV charging General Service signs. As part of these changes, FHWA adds clarity in the final rule that

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<sup>14</sup> FHWA’s Memorandum, “Regulatory Signs for Electric Vehicle Charging and Parking Facilities,” issued June 17, 2013, can be viewed at the following Web address: <https://mutcd.fhwa.dot.gov/resources/policy/rsevcpfmemo/>.

<sup>15</sup> FHWA Policy Memorandum, “MUTCD-Signing for Designated Alternative Fuels Corridors,” issued December 21, 2016, can be viewed at the following Web address: [https://mutcd.fhwa.dot.gov/resources/policy/alt\\_fuel\\_corridors/index.htm](https://mutcd.fhwa.dot.gov/resources/policy/alt_fuel_corridors/index.htm). Since the publication of the NPA this memorandum has been superseded by FHWA’s February 16, 2023, Memorandum on the same topic: [https://mutcd.fhwa.dot.gov/resources/policy/signing\\_alt\\_fuel\\_corridors/index.htm](https://mutcd.fhwa.dot.gov/resources/policy/signing_alt_fuel_corridors/index.htm). The substantive provisions relating to the signing of EV charging services remained unchanged in the 2023 memo.

directional trailblazing signing all the way to the charging service site is required when General Service signs are used.

The FHWA also adds a new Specific Service sign category in Chapter 2J for EV charging. The existing general provisions for Specific Service signs apply equally to EV charging Specific Service signs. The eligibility to have an EV charging business identification sign panel on a sign generally reflects eligibility criteria for National Electric Vehicle Infrastructure funding and other types of fueling services. To reflect public comments, the final rule also allows EV charging supplemental messages be added to the bottom of a business identification sign panel used on other categories of Specific Service signs (food, lodging, etc.) if the EV charging service at that business meets the same eligibility criteria for the EV charging General Service signs. As with all Specific Service signs, directional signing from the freeway to the EV charging service is required if the direction to the site is unclear or additional guidance is needed such as when subsequent turns onto other roads are required.

#### *AMBER Alerts on CMS*

In Section 2L.02, the NPA proposed a new Guidance statement recommending that America's Missing: Broadcast Emergency Response (AMBER) alerts should not preempt messages related to traffic or travel conditions, should be as brief as possible, and should not include other information, such as detailed descriptions of persons, vehicles, or license plate numbers.

Several State DOTs and the NCUTCD suggested that information regarding the vehicle, including the license plate, are essential pieces of information and are currently used for AMBER alert messaging. One State DOT shared its experience with using only a general vehicle description that resulted in generating an overwhelming number of 911 calls. Commenters indicated that more detailed information, such as the license plate number is necessary for AMBER alerts to be effective.



In response to comments, FHWA removes the Guidance specifically discouraging the use of descriptions of persons, vehicles, or license plate numbers as part of AMBER alert messages on CMS in the final rule. Guidance is retained that AMBER alert messages should be kept as brief as possible to address the potential of overloading road users with detailed information and, when possible, use other sources to convey that detailed information associated with the alert. Also, FHWA retains the proposed Guidance that AMBER alerts should not preempt messages related to traffic or travel conditions to ensure road user have real-time changing traffic and travel conditions requiring immediate motorist response. The FHWA believes the final rule is responsive to commenters and promotes the appropriate use of CMS to enhance public safety, consistent with Section 11135 of BIL.

#### *Safety Messages on Changeable Message Signs*

In Chapter 2L, FHWA proposed several provisions in the NPA related to safety messages on CMS. The NPA included new Guidance and Standard paragraphs in Section 2L.02 regarding the appropriate and allowable use of traffic safety campaign messages on CMS displays. The FHWA proposed this new language to clarify that safety and transportation-related messages—which had been and would continue to be allowed—should be clear and direct, and meaningful to the road user on the roadway that the message is displayed. The FHWA recommended that messages with obscure meaning, references to popular culture, that are intended to be humorous, or otherwise use nonstandard syntax for a traffic control device, not be displayed because they can be misunderstood or understood only by a limited segment of road users and, therefore, degrade the overall effectiveness of the sign as an official traffic control device. The FHWA proposed a Standard that only traffic safety campaign messages that are part of an active, coordinated safety campaign that uses other media forms as its primary means of

outreach be displayed on CMS, such that the CMS message would be a supplement to the overall campaign that employs other media and/or tools to promote the message.

While a number of commenters expressed support for the proposed provisions on traffic safety messages on CMS, others expressed opposition and suggested that the provisions should be less restrictive. Several commenters suggested moving all information related to traffic safety messages to a single section. Many commenters expressed concern that messages outside of the National Highway Traffic Safety Administration (NHTSA)-developed enforcement campaign slogans would not be allowed under the proposed revision. While some commenters did request more flexibility in safety messaging and CMS use in general, many commenters supported the proposed provisions to help stem what they viewed as overuse or inappropriate uses of CMS. Some commenters believed that the NPA should explicitly restrict specific types of messages and even develop a standardized library of acceptable messages.

In response to comments, FHWA places all information related to traffic safety campaign messages in Section 2L.07. In addition, as it was not the intent to restrict safety campaign messages only to those on the NHTSA Communications Calendar, FHWA revises the applicable Guidance provision so as not to imply that an agency is precluded from developing and displaying messages of its own traffic safety campaigns separate from the NHTSA campaigns.

The provisions on message construction and content, as proposed, are largely consistent with past and current human factors research in the areas of driver information overload, comprehension, the general principles for effective traffic control devices, and, specifically, messaging on CMS. These considerations were also the basis for FHWA's 2021 policy memorandum on CMS<sup>16</sup> use that was developed in collaboration with

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<sup>16</sup> FHWA's Official Ruling No. 2(09)-174 (I), "Uses of and Nonstandard Syntax on Changeable Message Signs," can be viewed at the following Web address:  
[https://mutcd.fhwa.dot.gov/resources/interpretations/2\\_09\\_174.htm](https://mutcd.fhwa.dot.gov/resources/interpretations/2_09_174.htm).

NHTSA. The Guidance provisions, as adopted, can be deviated from based on engineering judgement. However, FHWA believes these are important considerations as not to diminish respect for the sign when used in other traffic-related scenarios for regulatory, warning, and guidance under prevailing conditions.

### ***Part 3. Markings***

#### *Normal Line Width (4-inch to 6-inch Width)*

Based on comments to the NPA, a review of the relevant research, and the potential beneficial impacts of the recent final rule<sup>17</sup> related to maintaining pavement marking retroreflectivity that will increase pavement marking visibility, changing the width of normal and wide longitudinal lines is not adopted in the final rule and the existing provisions on longitudinal pavement marking width from the 2009 Edition are retained.

In Section 3A.04 Functions, Widths, and Patterns of Longitudinal Pavement Markings, in the Standard describing the widths and patterns of longitudinal lines, FHWA proposed in the NPA to revise the width of normal lines to indicate that 6-inch-wide lines are to be used for freeways, expressways, and ramps as well as for all other roadways with speed limits greater than 40 mph and that 4- to 6-inch-wide lines are to be used for all other roadways. The FHWA proposed this change to improve visibility and consistency on “high-speed” facilities and based on research showing improved machine vision detectability.

The FHWA also proposed to change the definition of a wide line to at least 8 inches in width if 4-inch or 5-inch normal lines are used, and at least 10 inches in width if 6-inch normal lines are used. This change was proposed to clarify the definition based on

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<sup>17</sup> National Standards for Traffic Control Devices; the Manual on Uniform Traffic Control Devices for Streets and Highways; Maintaining Pavement Marking Retroreflectivity Final Rule, 87 FR 47921, August 5, 2022.

varying practices for “normal” width lines and to reduce the impact on agencies that use 6-inch lines as their “normal” width.

In addition, FHWA proposed to add a new Guidance statement regarding the width of the discernible space separating the parallel lines of a double line so that they can be recognized as a double line rather than two, separate disassociated single lines.

The FHWA received several comments opposed to the new requirement for 6-inch-wide normal lines due to the additional cost. Commenters suggested that the financial impact was underrepresented since the change is not a one-time cost but also increased life-cycle costs related to ongoing maintenance with pavement resurfacing and marking “refreshing.” Some commenters also suggested that the extent of the proposed 6-inch requirement was not supported by research. A number of agencies stated they may decide not to install markings at all on roadways that do not meet the warrants for centerlines and edge lines in Sections 3B.02 and 3B.10 based on the increased cost of 6-inch markings, which may result in increased crashes. Several studies have shown that the presence of longitudinal pavement markings decreases crashes, including on roadways where the MUTCD provisions do not require or recommend the markings.<sup>18, 19</sup> Some commenters also stated additional research is needed for human road users, as well as driving automation systems, to determine the actual discernable limits for distinguishing between a normal and wide line and the discernable space between double lines.

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<sup>18</sup> Sun, X., and S. Das. A Comprehensive Study on Pavement Edge Line Implementation. FHWA/LA.13/508, April 2014 can be viewed at the following Web address: [https://www.ltrc.lsu.edu/pdf/2014/FR\\_508.pdf](https://www.ltrc.lsu.edu/pdf/2014/FR_508.pdf)

<sup>19</sup> Tsyganov, A., R. Machemehl, and N. Warrenchuk. Safety Impact of Edge Lines on Rural Two-Lane Highways in Texas. FHWA/TX-05/0-5009-1, September 2005 can be viewed at the following Web address: [https://ctr.utexas.edu/wp-content/uploads/pubs/0\\_5090\\_1.pdf](https://ctr.utexas.edu/wp-content/uploads/pubs/0_5090_1.pdf)

Additional Support statements are added to inform practitioners that based on research documented in FHWA's Wider Edge Lines Proven Safety Countermeasure<sup>20</sup>, 6-inch edge lines can provide a safety benefit over the minimum 4-inch edge lines on all facility types (e.g., freeways, multilane divided and undivided highways, two-lane highways) in both urban and rural areas. A reference to Section 5B.02 is also included to inform practitioners of the longitudinal pavement marking considerations relevant to driving automation systems. These changes will provide agencies information and the flexibility to determine where to use wider longitudinal lines based on data specific to their roadways, consistent with FHWA's Proven Safety Countermeasures for Roadway Departure.<sup>21</sup> Further, the proposed Guidance statement regarding the width of the discernible space separating the parallel lines of a double line is adopted with revision to specify the space should not exceed two times the line width of a single line.

### *Retroreflectivity*

When FHWA released the NPA for the 11th Edition, a separate rulemaking remained in progress to revise the MUTCD to include a Standard for the minimum level of retroreflectivity that must be maintained for pavement markings. Therefore, FHWA designated Section 3A.05 Maintaining Minimum Pavement Marking Retroreflectivity as reserved for the future provisions from the separate FHWA rulemaking, without any proposed text. Several commenters endorsed the inclusion of language in this final rule based on current research to facilitate both human vision and automotive cameras. It was noted that driving automation systems use pavement markings for guidance, and minimum retroreflectivity levels would enhance system reliability. A comment was made to exclude minimum retroreflectivity requirements for roads closed to the public at

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<sup>20</sup> FHWA Office of Safety Proven Safety Countermeasure on Wider Edge Lines (FHWA-SA-21-055) can be accessed at the following Web address: [https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-08/PSC\\_New\\_Wider%20Edge%20Lines\\_508.pdf](https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-08/PSC_New_Wider%20Edge%20Lines_508.pdf)

<sup>21</sup> FHWA Office of Safety Proven Safety Countermeasures on Roadway Departure can be accessed at the following Web address: <https://highways.dot.gov/safety/proven-safety-countermeasures>

night as the installation could otherwise be cost prohibitive where they are not currently installed, namely on park roadways.

The FHWA published the final rule on pavement marking minimum retroreflectivity on August 5, 2022 (87 FR 47921), which became Revision 3 to the 2009 edition of the MUTCD. As a result, FHWA incorporates the provisions from that completed rulemaking which include Support, Options, Guidance, and Standards regarding minimum maintained retroreflectivity levels for longitudinal pavement markings on all roadways open to public travel with speed limits of 35 mph and greater. Option statements define markings that may be excluded from the provisions of maintaining minimum retroreflectivity based on conditions such as ambient light levels, daily volume, and type of marking (e.g., dotted extension lines, curb markings, parking space markings, and shared-use path markings). The compliance date established by the final rule on pavement marking minimum retroreflectivity remains in effect and is added to Table 1B-1 in this final rule.

#### *Marked Crosswalks*

In the NPA, FHWA proposed to add a new Section 3C.02 Applications of Crosswalk Markings, containing several paragraphs from existing Section 3B.18. As part of this, FHWA proposed several revisions to clarify placement of crosswalks. A new Standard paragraph proposed in Section 3C.01 is adopted with revisions and located in Section 3C.02 in the final rule, since it includes requirements specific to the application of crosswalk markings. The Standard requires, after the agency or official having authority makes the determination to legally establish a crosswalk at a non-intersection location, that crosswalk markings shall be provided. The FHWA believes this is appropriate as it will improve safety, by clearly identifying the requirements of crosswalk markings at non-intersection locations which will help alert road users of a designated pedestrian crossing point and provide guidance for pedestrians by defining and

delineating paths across roadways, particularly vulnerable road users, in conformance with Section 11135 of the BIL.

In the NPA, FHWA retained some text unchanged from the 2009 MUTCD Section 3B.18, including the existing Guidance Paragraph 7 recommending crosswalk markings be installed where engineering judgment indicates they are needed to direct pedestrians to the proper crossing path(s) at locations controlled by traffic control signals or on approaches controlled by STOP or YIELD signs.

Many commenters indicated that crosswalk markings should be required (rather than recommended) at all crosswalks regardless of location, and particularly at signalized intersections. In response to comments, FHWA revises propose Paragraph 5 (now Paragraph 1), to indicate crosswalk markings should be installed at locations controlled by traffic control signals and adds an Option (Paragraph 2) to allow the crosswalk to remain unmarked if engineering judgement indicates they are not needed to direct pedestrians to the proper crossing path(s).

The FHWA believes that requiring all crosswalks to be marked in all locations would be a substantial change that would benefit from a review of relevant research to include stop lines, consideration of the impacts to signalized intersections in rural areas with no pedestrian facilities, consideration of the impacts to agencies with a significant number of intersections controlled by a STOP or YIELD sign, and additional public comment before being considered for adoption in the MUTCD as a Standard.

Changes to existing Guidance Paragraph 8 are adopted in Section 3C.02 Paragraph 4, with revisions in response to comments, with the intent to remove language which may have been previously misinterpreted as simply discouraging or avoiding the installation of crosswalks. Although not new Guidance, due to the importance of vulnerable road user safety, it is vital to reiterate the existing recommendation to conduct an engineering study in order to determine whether providing a marked crosswalk alone

is safe for locations not controlled by a traffic signal or STOP or YIELD sign, or if additional traffic control devices and other measures should be considered to reduce traffic speeds, shorten crossing distances, enhance the conspicuity of the crossing, or provide active warning of pedestrian presence, as further discussed in the revised existing Guidance Paragraph 9 (now Section 3C.03 Paragraph 6). The agency (or owner) having jurisdiction over the roadway is ultimately responsible for the decisions on what, and where, to build and the engineering study recommended aims to guide the recommended traffic control devices at the determined location.

In the final rule, FHWA revises the criteria to be considered in the recommended engineering study. In addition to the distance from adjacent signalized intersections, the distance to other controlled crossings should be considered. The existing pedestrian volume and delay criteria were expanded to include bicyclists, projected volumes, paths of travel, the ages and abilities of road users, and the location or frequency of public transit stops to guide practitioners on additional factors to consider in determining where to mark crosswalks away from controlled locations. An important factor is roadway context; on roadways where adjacent land use suggests that trips could be served by varied modes, it is important to provide safe crossings. Including projected volumes in the recommended engineering study can address concerns that pedestrian and bicycle demand may not be captured by a traffic count, as locations without an established crosswalk might be avoided by some pedestrians and bicyclists. Once the appropriate traffic control devices are installed, consistent with the adopted Paragraph 6 discussed below, to establish a safe crosswalk, the volume of pedestrians and bicyclists may increase due to the new or improved crossing. The existing criterion of the geometry of the location was expanded to specify the horizontal and vertical geometry of the crossing location to highlight the importance of stopping sight distance and visibility of road users utilizing a crosswalk and the potential effect on vulnerable road user safety. Analysis of



available gaps was also raised as a potential criterion for consideration in the recommended engineering study and FHWA believes this is included in pedestrian and bicyclist delays. The FHWA also received comments suggesting additional changes such as crash history and using pedestrian walking speeds in lieu of ages and abilities, specific warrants for crosswalks, or minimum spacing of crosswalks be included in the criteria of an engineering study. The FHWA believes crash history could be considered an “other appropriate factor” (item N) to be considered in the engineering study, but the other suggested changes from commenters would require further research before being considered in a future rulemaking effort.

Changes to existing Guidance Paragraph 9 are adopted as Paragraph 6 in Section 3C.02, with editorial revisions in response to comments. In order to protect vulnerable road users, FHWA provides recommendations of specific conditions where the installation of additional traffic control devices, and other measures, instead of simply marking a new crosswalk with signs alone, should be considered, consistent with FHWA’s Guide for Improving Safety at Uncontrolled Crossing Locations.<sup>22</sup> The recommendation is intended to improve pedestrian safety at uncontrolled crossing locations with posted speed limits 40 mph or greater and at locations where there is a crash threat due to multiple lane crossings or limited sight distance by encouraging the installation of additional traffic control devices or other measures, as appropriate, beyond the basic marked crosswalks and warning signs. Some of these additional measures include other traffic control devices and applications designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence.

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<sup>22</sup> FHWA’s Guide for Improving Safety at Uncontrolled Crossing Locations (FHWA-SA-17-072) can be accessed at the following Web address: [https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-07/STEP\\_Guide\\_for\\_Improving\\_Ped\\_Safety\\_at\\_Unsig\\_Loc\\_3-2018\\_07\\_17-508compliant.pdf](https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-07/STEP_Guide_for_Improving_Ped_Safety_at_Unsig_Loc_3-2018_07_17-508compliant.pdf)

## *Aesthetic Surface Treatments in Crosswalks, Islands, Medians, Shoulders, and Sidewalk Extensions*

### *General Discussion*

In the NPA, FHWA proposed changes to address applications of colored pavements, making a distinction between the use of color in a traffic control device application (e.g., red-colored pavement for public transit systems, and green-colored pavement for bike lanes) versus as an aesthetic surface treatment that is not intended to serve a traffic control purpose. Commenters addressed a number of issues surrounding aesthetic surface treatments, often with disparate views. Along with those views expressed, commenters also generally acknowledged that there is a lack of research or safety data, positive or negative, to support the proposed provisions on aesthetic surface treatments; how individuals with vision disabilities are impacted by different surface treatments with varying colors or patterns; and concerns with machine vision and driving automation systems' ability to detect and process nonuniform aesthetic treatments. In this final rule, FHWA maintains the distinction between colored pavements that serve a traffic control purpose, and aesthetic surface treatments, whether colored or not, that are applied for aesthetic purposes only and are not intended to serve a traffic control purpose.

The FHWA emphasizes that agencies that wish to employ surface treatments for aesthetic purposes in various scenarios have the flexibility to do so, as applicable Federal, State, and local laws and policies allow. However, the MUTCD does not prohibit the use of aesthetic surface treatments (including visually complex treatments, the designs of which might be characterized more as "artistic" in their composition), except in limited situations as described in more detail throughout this section. This includes the use of aesthetic surface treatments between the transverse lines within a crosswalk, in islands, in medians, in shoulders, within sidewalk extensions designated by pavement markings, or in other areas outside of the traveled way provided that the aesthetic surface treatment

does not mimic, obscure, or otherwise adversely impact the effectiveness of other traffic control devices, such as other pavement markings in that location.

Determination as to whether a surface treatment obscures or otherwise adversely impacts the traffic control devices is made by the State or local agency that owns and operates the roadway, taking into consideration any other Federal, State, or local laws, regulations, and policies governing the use of highway right-of-way unrelated to the MUTCD. The FHWA emphasizes that safety should be the top priority in making such determinations and, in many situations, the use of one of the high-visibility crosswalk patterns or the addition of other traffic control devices might instead be the appropriate measure to improve safety. New provisions are included in the final rule with the intent to provide agencies with information on reducing the likelihood of any aesthetic surface treatments compromising the effectiveness of traffic control devices by maintaining separation and contrast. The FHWA also adopts several provisions to help ensure that vulnerable road user safety is maintained, recognizing that agencies have the flexibility to make decisions taking into consideration a number of factors.

Although aesthetic surface treatments most often involve the use of single or multiple colors, the MUTCD employs the term “colored pavement” to refer exclusively to traffic control devices as contrasted with aesthetic surface treatments that might incorporate color. Colored pavement for traffic control purposes is optional and supplements other standard markings. Specific color applications for traffic control purposes include green-colored bicycle lanes, purple-colored electronic toll lanes, red-colored transit lanes, white for channelizing, and yellow for median islands and channelizing. The provisions for aesthetic surface treatments are included within the Colored Pavements Chapter of the MUTCD to distinguish them from colored pavements that are traffic control devices, and to clarify how an aesthetic surface treatment might

interact with a traffic control device so as not to adversely impact the effectiveness of the traffic control device.

The new edition of the MUTCD only addresses those colored pavements that are traffic control devices, or those aesthetic surface treatments that interact with traffic control devices, as the scope of the MUTCD is limited to traffic control devices. Colored pavements used for traffic control purposes communicate regulations, guidance, and warnings to road users; supplement other standard markings with standard, solid color applications to pavement; and meet retroreflectivity criteria where applicable in accordance with the MUTCD.

In contrast, surface treatments that are purely aesthetic do not include retroreflective elements; do not communicate regulations, guidance, warnings, or other information to road users; and do not interfere with or mimic traffic control devices. These aesthetic surface treatments are sometimes referred to as “street murals” or “asphalt art,” and might be a single solid color, or their designs might include multiple colors. Because these treatments are generally outside the scope of the MUTCD, the MUTCD does not prohibit them within the roadway right-of-way. Rather, as may be allowed by other Federal, State, or local statute, regulation, or policy, the determination of the acceptability of aesthetic surface treatments on street or highway right-of-way is determined by local or State authorities that have jurisdiction over the roadway. Therefore, the determination as to whether a particular aesthetic surface treatment is acceptable for use in the highway right-of-way falls outside the scope and provisions of the MUTCD except to the extent that the treatment might interfere with or mimic a traffic control device.

### *Continuing Research*

Due to the interest in aesthetic surface treatments on travel pavements for over a decade, and the heightened interest in the more complex or artistic types of aesthetic

surface applications in more recent years, in the NPA, FHWA requested comment on how more intricate designs and bright colors around standardized crosswalk markings improve the safety or operations at and around the crosswalk, while maintaining the recognition of the crosswalk. Jurisdictions often cite safety as the rationale for these types of installations. The FHWA requested that commenters support their position by providing quantifiable and objective data that they had collected or were aware of, such as from human factors evaluations or other studies. Specifically, FHWA sought information pertaining to the safety and navigation of road users, and any effects of non-standard designs on pedestrians with low visual acuity or other vision impairments. The FHWA also sought data on the ability of machine vision of driving automation systems to detect accurately and react appropriately to the markings as a crosswalk.

Some commenters stated that, to their knowledge, aesthetically treated crosswalks do not contribute to a degradation of road user safety; however, substantive quantifiable and objective data to support this position were not provided. Some commenters suggested that additional research be conducted to formulate appropriate regulations consisting of appropriate applications, designs, and materials before moving forward.

As mentioned earlier, FHWA has been aware that this area is of interest for communities and, in response to longstanding concerns, is conducting research on the safety implications of various types of surface treatments in crosswalks. The FHWA will use the results to inform potential changes to the MUTCD and/or the need for additional research into vulnerable road user safety at crosswalks.

The FHWA is also aware of a study conducted on the potential safety effects of “asphalt art”<sup>23</sup> which was published after the NPA docket closed. The study report concludes that there is a correlation between asphalt art and improved safety, though it

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<sup>23</sup> Asphalt Art Safety Study prepared by Sam Schwartz, a TYLin Company, for Bloomberg Philanthropies, April 2022, can be viewed at the following Web address: <https://www.samschwartz.com/asphalt-art-safety-study>

could not establish or infer causation, in part due to the confounding of a number of variables including other improvements made concurrently, and the inability to determine whether the art itself, additional traffic control, roadway, or roadside improvements resulted in the improvement. For example, it is generally accepted that a narrowing of the street or traveled way, such as with pavement markings to create sidewalk extensions or channelization, can reduce vehicle operating speeds. The extent to which the addition of aesthetic treatments within the reclaimed pavement at many of the study sites either contributed to, or inhibited, an improvement in safety could not be determined or was not reported. For this reason and, as stated in the study, to determine whether surface treatments individually contribute to vulnerable road user safety, FHWA is conducting research.

In addition, in response to comments, FHWA will continue to gather more data on the use of colored pavements that are part of traffic control markings to learn more about their overall safety impacts, with a particular focus on people with disabilities, including those with low visual acuity or cognitive impairments. The FHWA is in the process of completing closed-course research on the impacts of a subset of surface treatments in crosswalks consisting of brick patterns, multiple color arrangements, or more complex geometric designs using multiple colors in combination with different underlying standard crosswalk patterns. This research specifically includes pedestrians with low vision as research participants, in addition to pedestrians and drivers. The FHWA is pursuing additional open-course research to support the closed-course research. Upon statistically significant research results or measures of effectiveness from additional open-course studies suggesting there is a direct impact on vulnerable road user safety, further updates to the regulations surrounding surface treatments, beyond those updates included in this rule, might be considered in a future rulemaking effort. Similarly, this issue may be revisited based on the Architectural and Transportation Barriers

Compliance Board's (U.S. Access Board) Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way ("PROWAG") rulemaking<sup>24</sup> and other research into tactile wayfinding in transportation environments,<sup>25</sup> particularly when considering crosswalks and sidewalk extensions designated by pavement markings.

#### *Colored Pavement as a Traffic Control Device*

In Section 3H.01 (existing Section 3G.01), retitled, "Standardization of Application," FHWA adopts a new Standard paragraph limiting the use of colored pavement as a traffic control device only to where it supplements other markings. The FHWA adopts this change to improve upon the established widespread system of uniformity in the application of colored pavement used as a traffic control device. This requirement does not apply to colored pavements used as a purely aesthetic surface treatment. The proposed Standard regarding the colors to be used for colored pavement is not adopted, as an existing Standard paragraph in this Section already contains these requirements as they apply to colored pavements used as a traffic control device.

The FHWA adopts a new section numbered and titled, "Section 3H.02 Materials," to provide agencies with information to assist in the selection of appropriate colored pavement materials to improve road user safety. This section is adopted with revisions in response to comments; however, the proposed Support paragraph regarding wear of colored pavement is not adopted in the final rule, since it is not related to the use of a traffic control device, and the maintenance of traffic control devices is covered in other sections. Some commenters requested additional specific information on appropriate skid resistance values considering all road users. Historically, standard specifications for

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<sup>24</sup> Architectural and Transportation Barriers Compliance Board's Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way (RIN 3014-AA26) can be accessed at the following Web address: <https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=202210&RIN=3014-AA26>

<sup>25</sup> NCHRP 17-94 Tactile Walking Surface Indicators To Aid Wayfinding For Visually Impaired Travelers In Multimodal Travel which is managed under TCRP B-46 Tactile Wayfinding in Transportation Settings for Travelers Who Are Blind or Visually Impaired and can be accessed at the following Web address: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4513>

construction, including colored pavement or pavement marking material specifications containing specific skid resistance values or coefficients of friction, are developed by the individual State and local agencies based on their specific needs. As a minimum skid resistance value may have an impact on vulnerable road user safety, FHWA will review available research and information to inform potential future changes to the MUTCD or to another resource as appropriate.

#### *Aesthetic Surface Treatments – Interaction with Traffic Control Devices*

The FHWA proposed to add a new section numbered and titled, “Section 3H.03 Aesthetic Treatments in Crosswalks,” with two paragraphs from existing Section 3G.01 and new Standard, Guidance, Option, and Support to reflect FHWA’s Official Ruling No. 3(09)–24 (I) which was issued in response to a trend by some agencies toward installing treatments on roadway pavement that go beyond the basic aesthetics of the paving materials and instead include bright colors, visually complex graphics, images, or words. Some commenters supported the proposed changes noting the specific needs of people with low visual acuity or other vision impairments, along with the limited abilities of machine vision, to discern variations in surface treatments from standard markings. Other commenters stated that there is no evidence that suggests adverse impacts from these treatments on roadways with a posted speed limit above 30 mph. Many comments also indicated a lack of research that suggests surface treatments in general create safety concerns, and the proposed Standards are unfounded. Other commenters suggested that any regulation of aesthetic surface treatments is inappropriate in the MUTCD as they are not traffic control devices.

While FHWA agrees that aesthetic surface treatments are not traffic control devices, FHWA believes that this proposed section is appropriate because of the interaction with official traffic control devices that such treatments frequently pose. As stated earlier, it is important that these treatments not resemble or interfere with the



uniform appearance of traffic control devices, as that could confuse and distract road users. In response to comments, FHWA limits the Standards, Guidance, and Support included in the MUTCD regarding aesthetic surface treatments to those provisions that are necessary to help ensure pedestrian safety and the accessibility of individuals with disabilities, and to minimize any adverse impacts to the effectiveness of traffic control devices. As described earlier, the MUTCD does not prohibit the application of aesthetic surface treatments within the roadway. However, the MUTCD does limit their use or character to the extent that they interact with or relate to traffic control devices. In addition, the use of these treatments could be subject to other Federal, State, or local regulations and policies unrelated to the MUTCD. Those other regulations or policies might prohibit or otherwise limit the use of aesthetic surface treatments in some situations. In other words, aesthetic surface treatments are not of themselves prohibited by the MUTCD, but the MUTCD limits how the treatments might overshadow the nature of traffic control devices such as marked crosswalks. Transportation agencies implement aesthetic treatments at their own risk as permissible by local, State, and other Federal laws, regulations, and policies; as long as the treatments do not interfere with, confuse, or obstruct traffic control devices for any users, especially people with disabilities, including those with low visual acuity; and, ultimately, subject to an overall assessment of road user safety.

#### *Aesthetic Surface Treatments – Maintaining Separation and Contrast*

The FHWA adopts the newly proposed Section with a revised title, “3H.03 Aesthetic Surface Treatments” in response to comments that questioned the perceived restrictions by lack of specific language on aesthetic surface treatments at other locations such as islands, medians, shoulders, sidewalk extensions designated by pavement markings, or other areas outside the traveled way. New provisions are included in the final rule with the intent to provide agencies information on how to prevent aesthetic

surface treatments from compromising the effectiveness of traffic control devices by maintaining separation and contrast. Existing Support Paragraph 2 from existing Section 3G.01, is relocated to Section 3H.01 with edits, and additional revisions are made to the final rule in Sections 3H.01, 3J.03 and 3J.07 to clarify the difference between colored pavements used as traffic control devices and aesthetic surface treatments, and the considerations in the use of aesthetic surface treatments.

In the NPA, FHWA also proposed to add a new section numbered and titled, “Section 3J.07 Curb Extensions Designated by Pavement Markings” to include Support, Standard, Guidance, and Option paragraphs to improve consistency and uniformity when the application of pavement markings is to be used to create an extension of the sidewalk in the roadway pavement. The term “curb extension” was used in the NPA to refer to roadway pavement that is reclaimed and designated for non-vehicular use. However, the term “sidewalk extension” is adopted in the final rule because it more accurately describes the purpose of the concept and emphasizes the redesignation of that portion of the roadway exclusively for pedestrian use. The term is also in established use in several design resources and, therefore, will enhance consistency. In some cases, after evaluating the site-specific context, it may be determined that redesignation of the area as a sidewalk extension, which reduces roadway crossing distances but places pedestrians closer to vehicular traffic, is not appropriate. A new Support statement is also adopted referencing the applicable sections for channelizing lines, edge lines, and diagonal markings, which can be used to modify the street or highway design (e.g., horizontal alignment, traveled-way width, sight distance, or similar) for speed management and channelizing, but the marked area is retained as part of the roadway rather than be redesignated as a pedestrian space.

Several additional Guidance, Option, and Support paragraphs in Section 3J.07 that were proposed in the NPA are adopted with significant edits and clarifications in the

final rule to provide context and considerations to improve vulnerable road user safety and provide accessibility, particularly for individuals with low visual acuity or other vision disabilities. While FHWA agrees that accessibility concerns should be considered for these areas, defining the conditions under which accessibility infrastructure is or is not required is beyond the scope of the MUTCD and would be covered either explicitly or implicitly under other regulations, such as accessibility standards that may be adopted by DOT or DOJ under the Americans with Disabilities Act or Section 504 of the Rehabilitation Act of 1973. In response to comments, and consistent with definitions contained within the MUTCD, an additional Standard is adopted in the final rule prohibiting the extension of crosswalk markings through sidewalk extensions designated by pavement markings, which would represent that the area is still part of the roadway, rather than an extension of the sidewalk. Extending the crosswalk markings through this area would be confusing to individuals with low visual acuity who rely on the crosswalk markings as one of the cues to confirm that they have left the sidewalk and entered the street where vehicular traffic is present. However, the proposed Guidance recommending that adequate provisions be made for pedestrians with disabilities through the sidewalk extension, between the physical curb ramp and the start of the crosswalk at the new edge of the traveled way as designated by the pavement marking, is not adopted as this is outside the scope of the MUTCD. In addition, the recommendation to use colored pavements in sidewalk extensions where pedestrian travel is expected is not adopted as this area is outside of the traveled way, and the details of the type of surface treatment used, if any, would not be subject to the provisions of the MUTCD except where it meets the pavement marking that defines the limits of the pavement open to vehicular travel. Accordingly, FHWA adopts a requirement that if aesthetic surface treatments are used in sidewalk extensions, they shall not be retroreflective as they are not traffic control devices.

Comments were received that question the stipulation that the right-of-way is dedicated exclusively to highway-related functions, which undermines “placemaking” efforts. The proposed language was a reference to existing regulations that codify requirements related to the use of highway right-of-way.<sup>26</sup> Notwithstanding, in response to comments, FHWA does not adopt the NPA proposed Guidance recommending that a policy for using aesthetic surface treatments in crosswalks should be considered if an agency determines that the use or design is appropriate for the right-of-way, since these treatments are adequately addressed in other provisions. Similarly, the Guidance recommending a speed limit threshold for which aesthetic crosswalk treatments should only be considered is not adopted. To ensure that the safety of road users remain the primary consideration, two additional Standards are adopted requiring that aesthetic surface treatments not interfere with traffic control devices, and that the colors used for aesthetic surface treatments not be standard traffic control device colors. The proposed Standard requiring aesthetic surface treatments not be of a surface that can confuse vision-impaired pedestrians that rely on tactile treatments or cues for navigation is adopted with editorial revision. Additional Guidance is also adopted in the final rule with recommendations to provide a gap between standard markings delineating areas and aesthetic surface treatments such that contrast is provided and the treatments do not interfere with traffic control devices. The proposed Standard prohibiting the use of advertising, pictographs, symbols, multiple color arrangements, and retroreflectivity in patterns that constitute a purely aesthetic surface treatment is revised with a prohibition on advertising and retroreflectivity retained in the Standard. Guidance is adopted to recommend against the use of pictographs and symbols with an additional recommendation not to use illusions. The proposed Support statements relating to materials for aesthetic surface treatments within the limits of crosswalks are also adopted

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<sup>26</sup> 23 CFR 1.23(b).

with revision; specifically, paving materials such as setts or cobbles are removed, and Support is added relating to the surface of the crosswalk, the needs of pedestrians, and the requirements of the U.S. Department of Justice 2010 ADA Standards for Accessible Design.<sup>27</sup>

Comments questioned the need for the Standard statement requiring aesthetic treatments to be designed such that they do not encourage road users to loiter or linger in the crosswalk, engage in the pattern, or otherwise not vacate the street in an expedient manner. The FHWA disagrees that the Standards and Guidance placing limitations on aesthetic treatments are unfounded as road user safety is the primary concern and visual distractions to vehicle operators in general are known to be a potential safety risk, especially to vulnerable road users. Many of the surface treatments that have been used are designed to draw the attention of road users to the treatment and, therefore, away from navigating the roadway environment. Thus, without adequate research data to determine the actual safety risk of different types of treatments, FHWA believes it is necessary to limit the use of surface treatments to ensure vulnerable road user safety. Where such treatments were being considered as a measure to improve pedestrian safety, FHWA believes the appropriate measure, instead, is to use one of the high-visibility crosswalk patterns, which are supported by research for visibility and conspicuity, strengthening the provisions for the protection of vulnerable users, consistent with section 11135 of BIL.

#### ***Part 4. Highway Traffic Signals***

##### *Accessibility*

In an effort to improve accessibility to provide for the protection of vulnerable road users while not getting ahead of the then-pending PROWAG rulemaking, FHWA proposed numerous changes to improve accessibility in Parts 4 and 6. In Part 4, the

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<sup>27</sup> September 15, 2010. 28 CFR 35 and 36, Americans with Disabilities Act of 1990.

proposed changes were to recommend, rather than provide an option, to use accessible pedestrian signals (APS) at all pedestrian signals, including pretimed traffic control signals or non-actuated approaches as well as at pedestrian hybrid beacons (PHB). Further, FHWA proposed to recommend the use of an audible information device (AID) at rectangular rapid flashing beacons, pedestrian-actuated warning beacon, and in-roadway warning lights at crosswalks.

In Part 6, FHWA proposed to add a new requirement in accordance with 28 CFR 35.160(a)(1) to take appropriate steps to ensure that communications with applicants, participants, members of the public, and companions with disabilities are as effective as communications with others. In addition, FHWA proposed to revise several Standards to remove text related to “where pedestrians with disabilities normally use” or “where it is determined that the accommodations of pedestrians with disabilities is necessary” to strengthen requirements for accessible features and remove ambiguity on when they should be implemented. The proposed changes in Part 6 were slightly broader than proposed changes in Part 4 because changes for temporary traffic control devices are easier for agencies to adopt since the devices are temporary and are purchased and installed as part of an active construction or maintenance project.

The FHWA received a large number of comments related to the proposed changes encouraging the incorporation of PROWAG and to strengthen accessibility requirements. The comments stated that FHWA should adopt positions of greatly increased accessibility requirements similar to what was anticipated in the final rule for PROWAG. Other commenters, including many State DOTs and local agencies opposed significant accessibility changes based on their concerns with the cost impact and the significant level of effort to implement widescale increased accessibility measures, especially if there was not a demonstrated need for such accommodations at a specific location. The FHWA notes that at the time of publication of the NPA, the U.S. Access Board had not

concluded its rulemaking and the provisions of a potential final rule were unknown. The U.S. Access Board has since finalized its rulemaking process for PROWAG (88 FR 53604, August 8, 2023; effective date September 7, 20203). Therefore, FHWA did not have the opportunity to seek public comment on adopting the provisions of the PROWAG final rule during the course of this rulemaking. As such, FHWA only adopts the proposed NPA revisions that strengthen the provisions for the protection of vulnerable users, consistent with section 11135 of BIL. The FHWA anticipates the MUTCD undergoing further rulemaking to address sections affected by the final PROWAG. In the meantime, DOT has initiated a rulemaking to incorporate the PROWAG into the ADA regulations of the Office of the Secretary of Transportation.<sup>28</sup> *Traffic Control Signal Needs Study (Reexamine Signal Warrants and Changing Signal Warrants from Standard to Guidance)*

In the NPA, FHWA proposed to change all paragraphs describing the application of the traffic signal warrant criterion to be considered in an engineering study for installing a new traffic control signal from Standard to Guidance. The FHWA proposed this change to provide agencies flexibility in performing signal warrant analyses.

There were many comments for and against the change from Standard to Guidance. Commenters who supported the change agreed agencies would have more flexibility to consider “other factors” rather than the perceived heavy reliance placed on the numerical analysis. In their opinion, this leads to many agencies refusing to consider a traffic control signal in cases where a signal may be deemed beneficial, but the volume warrants are not met. Commenters who opposed the change were concerned with the cost impact associated with receiving pressure to install new signals where signals may not be appropriate. While not proposed in the NPA, FHWA received several comments

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<sup>28</sup> See U.S. Department of Transportation, Office of the Secretary of Transportation: Transportation for Individuals With Disabilities; Adoption of Accessibility Standards for Pedestrian Facilities in the Public Right-of-Way (RIN 2105-AF05).

stating that there is a need to rethink all traffic signal warrants believing them to be outdated and based on consensus rather than research. The FHWA notes that additional research is in progress through a National Cooperative Highway Research Program (NCHRP) study<sup>29</sup> examining updates to the vehicular and pedestrian volume thresholds for traffic control signals, pedestrian hybrid beacons, and other pedestrian-actuated warning devices. In addition to pedestrian and vehicular volumes, the research is also examining latent pedestrian demand, land-use, and context to develop additional tools to assist in determining the appropriate traffic control device to improve safety for pedestrians. Following the issuance of this final rule, FHWA will explore opportunities for new research to reexamine the remaining signal warrants for potential updates and will consider research-based updates to a future revision to the MUTCD or through Interim Approval, as appropriate.

The FHWA adopts the NPA proposed signal warrant language change from Standard to Guidance to reinforce that other factors, beyond the warrants, be considered as part of the engineering study to justify installation of traffic control signals. With this revision, agencies will have more flexibility to consider other relevant factors in addition to reliance on the numerical warrants analysis alone. While there is concern from some commenters who opposed the change that there could be increased costs associated with installing more traffic control signals and increased pressure to install new signals where they might not be appropriate, the adopted text provides agencies the necessary flexibility to consider all relevant factors in determining the need for a traffic control signal. The safe and efficient movement of all road users is the primary consideration in the engineering study to determine whether a traffic control signal should be installed rather than some other type of control or roadway configuration. Control by a traffic signal

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<sup>29</sup> NCHRP 03-143, Framework and Toolkit for Selecting Pedestrian Crossing Treatments, can be viewed at the following Web address:  
<https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5125>



does not necessarily result in improved safety in every case. In some cases, a traffic signal at an inappropriate location could adversely impact safety for one or more road users. The purpose of the engineering study is to evaluate all relevant factors based on the specific location. The warrants are elements of the engineering study along with any other relevant factors. These additional considerations form the basis for conducting an engineering study and the results of the warrants analysis portion of the study is not intended to be the only or the overriding consideration. Agencies can, in fact, install a traffic control signal if a warrant is not met, but they are required to conduct the engineering study that demonstrates that the installation of a signal will improve the overall safety and/or operation of the intersection, which includes documentation of the rationale (i.e., the warrants analysis and consideration of other factors).

#### *Signal Warrants – Crash Warrant*

In Section 4C.08 Warrant 7, Crash Experience, FHWA proposed to revise Item B in Paragraph 2 to include updated signal warrant criteria for 1-year and 3-year periods, crash type, and severity, as well as major street speed and intersection location (urban vs. rural context).

In conjunction with this change, FHWA proposed to add additional Support language regarding the critical minor-street volume, and a new Option paragraph that accompanies new tables related to criteria for considering traffic control signals in rural areas. The FHWA proposed these changes based on Interim Approval 19 and findings contained in NCHRP Project 07-18, “Crash Experience Warrant for Traffic Signals.” The research resulted in updated criteria, which is based on either 1 year or 3 years of recent crash experience, for the number of crashes portion of Warrant 7.

Comments included a mixture of support and concern. Some commenters suggested that this approach is not consistent with Vision Zero and Safe System approaches in that it is reactive instead of proactive. For rural intersections, there also

was concern the threshold for the number of crashes increased over the existing threshold in the 2009 MUTCD. Other commenters (primarily State DOTs) expressed concerns the lower thresholds for urban settings may result in the overuse of signals and disregard for using other safety alternatives at intersections. The commenters who supported the change appreciated that the values were updated based on research and noted that the various thresholds and tables provided engineers more flexibility to perform the signal warrant study.

The FHWA adopts the revisions to Warrant 7 in the final rule. Based on comments received, FHWA adds an Option in the final rule allowing agencies to calibrate Highway Safety Manual safety performance functions (SPFs) to their own crash data or develop their own SPFs to produce agency specific average crash frequency values. When documented as part of the engineering study, these agency specific crash frequency values may be used instead of the values shown in Tables 4C-2 through 4C-5 when applying the Crash Experience signal warrant.

#### *Pedestrian Signals at Signalized Intersections*

In Section 4D.02, Provisions for Pedestrians, FHWA proposed in the NPA to add a new Guidance statement recommending pedestrian signal heads at each marked crosswalk controlled by a traffic control signal. The installation of pedestrian signal heads at intersections controlled by a traffic control signal is currently at the discretion of the agency. Agencies may exercise engineering judgement to determine if pedestrian signal heads are needed, or if a vehicular signal face for a concurrent vehicle movement, and visible to pedestrians, is sufficient.

The FHWA received numerous comments (including from multiple State DOTs and cities) suggesting strengthening the proposed Guidance to a Standard to require, rather than recommend, pedestrian signal heads if marked crosswalks are present at

signalized intersections. A smaller number of commenters supported the addition of the new Guidance as proposed.

The FHWA adopts the NPA proposed Guidance that recommends the installation of pedestrian signal heads for each marked crosswalk controlled by a traffic control signal and also adopts the NPA proposed Option that allows agencies to apply engineering judgment to use pedestrian signal heads under other conditions. Based on the comments suggesting pedestrian signal heads be required at all signalized intersections, FHWA will consider for a future rulemaking after further evaluation of the potential implications and benefits. This issue may also be revisited based on the PROWAG rulemaking by the U.S. Access Board. These changes are being adopted to improve the protection of vulnerable users consistent with Section 11135 of BIL.

#### *Accessible Pedestrian Signals Engineering Study Requirement*

In Section 4I.01 (existing Section 4E.01) Pedestrian Signal Heads, FHWA proposed in the NPA to modify Paragraph 2 to better align with the recommendation for an engineering study with specific factors for consideration as outlined in Section 4K.01.

The intent of the proposed NPA text was misinterpreted by many reviewers. There were many comments pointing out that an engineering study should not be required before installing APS. Many commenters suggested APS should be installed at all traffic control signals and PHBs where pedestrian signal heads are used, and that agencies should not have to justify the need for APS by conducting an engineering study based on the factors listed in Section 4K.01.

Upon consideration of all comments received, FHWA is removing all text from the MUTCD discussing when APS “should” be considered or provided. The decision of when to use APS is subject to requirements of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973. Notably, since the 2009 edition of the MUTCD, multiple courts have recognized that the ADA and Rehabilitation Act require

jurisdictions to make their pedestrian signals accessible. *See Am. Council of Blind of Metro. Chicago v. City of Chicago*, No. 19 C 6322, \_\_\_ F. Supp. 3d \_\_\_, 2023 WL 2744596, at \*\*6-8 (N.D. Ill. Mar. 31, 2023); *Am. Council of Blind of New York, Inc. v. City of New York*, 495 F. Supp. 3d 211, 232-38, 241-42 (S.D.N.Y. 2020); *Scharff v. Cnty. of Nassau*, No. 10 CV 4208 DRH AKT, 2014 WL 2454639, at \*12 (E.D.N.Y. June 2, 2014). As with other sections of the MUTCD that address certain accessibility issues, FHWA refers users to the applicable ADA and Rehabilitation Act requirements and limits discussion of APS to technical specifications. The MUTCD does, however, include language in Support statements with information about the importance of APS in general and, in particular, at certain kinds of crossings.

#### *Warrants for Pedestrian Hybrid Beacons*

In Section 4J.01 (Section 4F.01 of the 2009 MUTCD) Application of PHB, FHWA proposed to add a new Option to allow the reduction of the signal warrant criteria for pedestrian volume crossing the major street by as much as 50 percent if the 15th-percentile crossing speed of pedestrians is less than 3.5 feet per second. The FHWA proposed this change for consistency with traffic control signal Warrant 4, Pedestrian Volume.

The FHWA also proposed to add an Option to allow the separate application of the major-street traffic volumes criteria in each direction when there is a divided street having a median of sufficient width for pedestrians to wait in accordance with Official Ruling No. 4(09)–25 (I)<sup>30</sup> and for consistency with the proposed change in Section 4C.05.

While the NCUTCD and engineering organizations agreed with the proposed changes in the NPA for Section 4J.01, the majority of the comments were related to the current MUTCD text regarding the volume thresholds, where no revisions were

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<sup>30</sup> FHWA’s Official Ruling No. 4(09)-25 (I), “Application of the Pedestrian Volume Warrant on Divided Roadways,” can be viewed at the following Web address: [https://mutcd.fhwa.dot.gov/resources/interpretations/4\\_09\\_25.htm](https://mutcd.fhwa.dot.gov/resources/interpretations/4_09_25.htm)

proposed. General themes of the comments included: (1) Suggestions to add other warrants or factors such as distance to adjacent pedestrian crosswalks, crash experience, using FHWA's Guide for Improving Safety at Uncontrolled Crossing Locations<sup>31</sup> surrounding land use and density, and using FHWA's Safe Transportation for Every Pedestrian (STEP) guidance,<sup>32</sup> (2) Changes to the minimum thresholds in Figures 4J-1 and 4J-2, and (3) Adding Guidance that aims to make major streets safe to cross at regular intervals by establishing Guidance on the distance people can be expected to walk to get to a crosswalk.

The FHWA retains the NPA language, including the existing vehicular and pedestrian volume threshold figures, based on the following considerations. The PHBs are addressed in the FHWA Proven Safety Countermeasure Initiative (FHWA-SA-21-045)<sup>33</sup> as a safety strategy to address pedestrian crash risk. The PHB is an intermediate option between a flashing beacon and a full pedestrian signal because it assigns right-of-way and provides positive stop control. It also allows motorists to proceed once pedestrians have cleared their side of the travel lane(s), reducing vehicle delay and congestion, often in urban conditions where congestion can impact the quality of life of surrounding residents and business owners.

In response to comments suggesting changes that were not proposed in the NPA, the existing vehicular and pedestrian thresholds were determined based on research and are substantially lower than the pedestrian volume warrants for a traffic control signal, primarily due to the trade-off in efficiency since vehicular traffic can move during the flashing red interval (concurrent with flashing Don't Walk) if the crosswalk is clear. Further, the NPA added new Options to provide more flexibility in justifying the installation of PHBs with a significant reduction in the threshold volumes based on lower

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<sup>31</sup> [https://www.fhwa.dot.gov/innovation/everydaycounts/edc\\_5/docs/STEP-guide-improving-ped-safety.pdf](https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/STEP-guide-improving-ped-safety.pdf)

<sup>32</sup> <https://highways.dot.gov/safety/pedestrian-bicyclist/step>

<sup>33</sup> <https://highways.dot.gov/safety/proven-safety-countermeasures/pedestrian-hybrid-beacons>

walking speeds and the consideration of other factors that may support the installation of PHBs at locations where the thresholds are not met. These proposed Options are adopted in this Final Rule.

An NCHRP study<sup>34</sup> is underway that will review the existing volume thresholds and make recommendations on pedestrian warrants based on many scenarios for PHBs as well as traffic control signals and pedestrian actuated warning devices. This information will be used to consider revisions to vehicular and pedestrian volume thresholds in a future edition of the MUTCD.

The FHWA believes the provisions, as adopted, further FHWA's statutory obligation under Section 11135 of BIL to provide for the protection of vulnerable road users by providing more flexibility for engineers to justify installation of PHBs.

#### *Emergency Vehicle Preemption*

In new "Section 4F.19 Preemption Control of Traffic Control Signals" consisting of paragraphs from Section 4D.27 of the 2009 MUTCD, FHWA proposed to revise the Standard regarding preemption control transitions to remove the current provision that allows the pedestrian change interval to be truncated during emergency vehicle preemption. The current provision potentially exposes vulnerable road users to great risk if they are crossing the street and their pedestrian indication is terminated mid-crossing to permit the signal to change to green on that approach in preparation for an approaching emergency response vehicle. The FHWA proposed this change to enhance the protection of vulnerable road users during emergency preemption operations at traffic control signals. Truncating the pedestrian change interval would still be allowed 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, as emergency vehicles and buses

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<sup>34</sup> NCHRP 03-143, Framework and Toolkit for Selecting Pedestrian Crossing Treatments, can be viewed at the following Web address:  
<https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=5125>

generally have the ability to slow, stop, or alter their course if necessary to avoid a collision, which is not the case of boats and rail traffic.

The FHWA received many comments on different sides of the issue. Some commenters supported the change since the existing method could potentially compromise pedestrian safety if pedestrians had not cleared the crosswalk during the transition into preemption control. Other comments opposed the change saying the effectiveness of the emergency vehicle preemption will be greatly diminished or made completely ineffective due to increased delay, especially in congested conditions. Some comments suggested the requirement did not go far enough in that it continued to allow pedestrian change interval to be preempted for signals associated with boat and rail traffic. The FHWA believes there is insufficient data on the magnitude of these potential issues and therefore does not adopt the proposed Standard that would prohibit the truncation of the pedestrian change interval during the transition into preemption control. Also, FHWA revises the existing Standard and adds an Option to further clarify what is allowed and what is prohibited by the existing provisions.

#### *Bicycle Signal Faces at Pedestrian Hybrid Beacons*

The FHWA proposed a prohibition of bicycle signal faces at pedestrian hybrid beacons in a new Chapter 4H, consistent with Interim Approval 16 (IA-16), which states, “bicycle signal faces shall not be used in any manner with respect to the design and operation of a pedestrian hybrid beacon.”<sup>35</sup> Though comments varied on this change, a number of commenters expressed concern that such a change would leave no solution to improve safety for bicyclists. However, the change is actually intended to address the fact that bicyclists are vulnerable road users and that they benefit from applying a safe system approach, which is to separate them in time and space from conflicting traffic

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<sup>35</sup> Interim Approval 16 can be accessed at the following Web address: [https://mutcd.fhwa.dot.gov/resources/interim\\_approval/ia16](https://mutcd.fhwa.dot.gov/resources/interim_approval/ia16).

movements. Where the crossing is a shared-use path or bicycle traffic is otherwise expected, the use of the PHB could contravene this approach. This specific issue is discussed in detail in this section.

Some of the commenters supported the proposed text to prohibit bicycle signal faces at PHBs, including some city and State transportation agencies. However, a number of the public comments opposed the prohibition of bicycle signal faces at PHBs, noting that some agencies currently have these in operation (Portland, Oregon; and Phoenix and Tucson, Arizona.) without any known safety issues. Some commenters suggested that the prohibition of bicycle signal faces with a PHB would not allow for bicycle movements (since bicyclists are not pedestrians) when PHBs are used at neighborhood bikeway or trail crossings. Other commenters noted the known problem with bicycles entering crosswalks controlled by PHBs during the flashing red and flashing Don't Walk interval, suggesting that this conflict can be addressed by allowing bicycle signal faces.

The FHWA retains the NPA language that prohibits bicycle signal faces at PHBs based on the following considerations. Intersections of streets and shared-use paths are a vehicle-vehicle intersection because bicycles operate as vehicles in this situation. The PHB was developed as a pedestrian-specific device based on representative pedestrian behavior and characteristics. A pedestrian-type traffic control would not be appropriate for bicycle traffic operating as vehicles with much higher relative speeds than pedestrians and therefore violates road user expectancy and introduces a safety risk for bicyclists due to the manner in which the clearance interval operates. The clearance interval for a PHB allows roadway traffic to proceed after stopping during the flashing red interval as pedestrians clear the crosswalk during the flashing Don't Walk interval. The slower speed of pedestrians provides for visibility of pedestrians and adequate detection time by



the vehicle operator, in contrast with the relatively higher speed of bicycle traffic that might enter the crossing more suddenly.

The FHWA notes that the suggestion that bicycle traffic would not be allowed at a crossing with a PHB absent a bicycle signal face tends to disregard the fact that other treatments could be considered to accommodate the safe mobility of bicyclists. Further, each traffic control device is developed for specific purposes. Therefore, it is not correct to assume generally that any traffic control device can be applied in any condition or be adapted to conditions for which it was not intended without evaluation of its efficacy under those conditions that differ, including for differences in the types of road users and their distinct behaviors and needs. The PHB is an intermediate solution between a flashing beacon and a full signal because it assigns right-of-way and provides positive stop control, but then allows roadway traffic to proceed once pedestrians have cleared their side of the travel lane(s), reducing vehicle delay and congestion, often in urban conditions where congestion can impact the quality of life of surrounding residents and business owners. In the absence of a similar intermediate option for bicycles operating as vehicles, operation of a fully signalized crossing is a potential solution, with little difference in the infrastructure compared with a PHB. The FHWA believes that an agency would decide to prioritize safety considerations for bicyclists as vulnerable road users over congestion or delay concerns for roadway traffic in such a case. These considerations are part of the process for determining the potential effects on the surrounding community environment, including residents and business owners.

In practice, some of the agencies that have installed bicycle signals with PHBs, as referenced by commenters, have done so in a manner that violates the provisions of the MUTCD for the operation of the PHB, shortening the flashing red interval to a mere few seconds while extending the steady red, allowing the pedestrian clearance (flashing Don't Walk) interval during the steady red facing roadway traffic (along with the green and

yellow bicycle signal intervals). In effect, these agencies are operating the PHBs as full signals, but have modified their phasing in a noncompliant manner in order to circumvent the warrants for a traffic control signal. As described earlier, an agency may decide that a full signal is the appropriate solution at a shared-used path crossing if there is appreciable bicycle demand. Further, the noncompliant operation of the PHB presents expectancy violations to both the pedestrian and roadway vehicle operator, potentially putting vulnerable road users at risk. The FHWA believes the provisions, as adopted, meet FHWA's statutory obligation under Section 11135 of BIL to provide for the protection of vulnerable road users to the extent practicable based on available research on the operation of PHBs as a pedestrian safety treatment.

Following the issuance of this final rule, FHWA will seek opportunities to explore and evaluate data on variations in PHBs that might safely accommodate bicycle signal face use at crossings and, potentially, new research on this topic as might be determined necessary to evaluate such factors as the appropriate clearance interval, adequate separation of pedestrians and bicyclists at the signal, actuation of the bicycle signal, and representative bicyclist and driver behavior at various types of signal indications or combinations thereof.

Finally, as emphasized previously, roadway owners have the authority to consider other treatments to accommodate the safe mobility of bicyclists, whether traffic control devices whose applications comply with the MUTCD, or other strategies, such as geometric or roadway configuration changes.

### ***Part 5. Automated Vehicles***

Part 5 in the NPA was retitled for Automated Vehicles (AV) and included all new content. (In the NPA, the provisions for Low-Volume Roads in Part 5 of the 2009 MUTCD were proposed for integration into the other parts of the MUTCD.) The purpose of this new part is to provide agencies with general considerations for vehicle automation

as they assess their infrastructure needs, prepare their roadways for AV technologies, and to support the safe integration of AVs. The NPA proposed two chapters for Part 5, with a third chapter reserved for future considerations. The first chapter, Chapter 5A, covered the purpose and scope, the definition of terms and other general information on design and use considerations for roadways intended to accommodate AVs operations. Chapter 5B “Provisions for Traffic Control Devices” contains six sections providing provisions beneficial to AV operations on signs, markings, traffic signals, and temporary traffic control, as well as traffic control at railroad and light rail transit grade crossings, and on bicycle facilities.

The overarching comments on this Part ranged from general support to concerns it will create a cost burden on transportation agencies and suggesting the removal of the Part. Other comments proposed moving the elements of Part 5 directly into the applicable chapters of the MUTCD (Parts 2, 3, 4, 6, 8, and 9). Comments in opposition to Part 5 as a whole or recommending the provisions in Part 5 simply be moved into the other chapters of the MUTCD, indicate confusion by commenters on the intended purpose of adding Part 5 to the MUTCD. The intended purpose of Part 5 is to identify traffic control device considerations for AVs operations on roadways specifically being designed to accommodate these vehicles.

There were also comments on the technical basis of some provisions. Some commenters questioned the need for a prescribed light-emitting diode (LED) refresh rate for electronic message signs and traffic signals, as well as graphical markings on signs intended to be recognizable by vision-based driving automation systems to enhance sign recognition by these systems. Also, there were comments received on the proposed Standard and Guidance statements in Section 5B.04 that described the use and removal of pavement markings in work zones. Commenters noted that the provisions in this section were redundant or in conflict with similar provisions in Chapter 6J of the Manual.

The FHWA adopts the new Part 5 with modified Support language emphasizing that Part 5 contains provisions that are exclusively for those agencies seeking to better accommodate driving automation systems to support AVs, and therefore are not specifically for consideration on other roadways. This change is done to address the confusion suggesting the provision in this Part will necessarily increase agency costs. In alignment with this change, the title is changed to “Traffic Control Device Considerations for Automated Vehicles” to more accurately reflect the contents of this new Part.

To address a safety concern of a technology brought up by commenters that could negatively impact recognition and legibility of signs by human drivers, FHWA adds a Standard stating that when scanning graphics of any type are used on a sign for support of driving automation systems, the scanning graphics shall not be visible to the human eye and the sign shall have no apparent loss of resolution or recognition to road users. Also, in response to comments, the final rule deletes specifications regarding refresh rates and instead indicates that agencies should consider the refresh rate of LEDs on CMS. This language will allow agencies to use the refresh rate that is most appropriate for the prevailing driving automation systems technologies as this technology advances.

Also, in response to comments, sections within Chapter 5B are restructured to more clearly state the specific traffic control device provisions. Further, in response to comments, the proposed Standards in Section 5B.04 regarding the use and removal of pavement markings in work zones are removed in this final rule, as they are redundant to similar provisions in Chapter 6J. Two new Support statements are added that reference the appropriate provisions in Sections 6J.01 and 6J.02 regarding the use and removal of pavement markings in work zones. The proposed Standard requiring the removing or obliterating pavement markings that are no longer applicable as soon as practicable is changed to Guidance to be consistent with similar provisions in Section 6J.01. Also, an additional Support statement is added that emphasizes the potential for misinterpretation

by driving automation systems of pavement markings not fully removed or removed in a manner that causes pavement scarring, which can facilitate erroneous vehicle positioning in work zones. The new Part 5 addresses the requirement in BIL to update the MUTCD for the safe integration of AVs onto public streets.

### ***Part 8. Traffic Control for Railroad and Light Rail Transit Grade Crossings***

#### *Diagnostic Team*

In the NPA, FHWA proposed Standards, Guidance, and Options in Part 8 that define the Diagnostic Team and its role in determining the appropriate traffic control devices at grade crossings. The language in the NPA was proposed to be consistent with 49 CFR part 222 (a Federal Railroad Administration regulation) and because there are many variables to be considered and multiple entities that need to be engaged to evaluate and implement traffic control devices at grade crossings. Depending on the crossing location, these entities include agencies representing the highway, railroad, transit, and a regulatory agency with statutory authority (when applicable).

Comments on the NPA noted that in some States, the State or the regulatory agency holds statutory authority for approval of traffic control devices at grade crossings and therefore the Diagnostic Team could evaluate but would not approve the grade crossing traffic control devices. Commentors also expressed confusion over the types of changes that necessitate convening a Diagnostic Team and concern with the challenges of assembling a Diagnostic Team. Some comments also suggested that all references to the Diagnostic Team be removed from Part 8. Other commenters, including organizations representing large numbers of members supported the text proposed in the NPA.

The FHWA incorporates editorial revisions in the final rule to clarify the role of the Diagnostic Team, which is to evaluate and recommend traffic control devices. These revisions are made to avoid conflicts with State statutes that give approval authority to the State or to the regulatory agency with statutory authority. The revisions also provide

a more complete list of the types of changes that require the Diagnostic Team to conduct an engineering study. The Option statement proposed in the NPA clarifies that general maintenance activities and minor operational changes may be made without review by a Diagnostic Team. In the final rule, FHWA also moves the reference to quiet zones to an Option statement because 49 CFR part 222 does not require a Diagnostic Team review to establish a quiet zone, but they may conduct an engineering study and recommend that a quiet zone be considered by the responsible public authority.

### ***Part 9. Traffic Control for Bicycle Facilities***

#### *Bicycles as Vehicles*

State and local laws and ordinances define where it is legal to ride a bicycle. Roadway owners and local communities may choose land use or facility design to promote bicyclist safety. The MUTCD, however, governs the traffic control devices and markings used on those facilities to improve bicyclist safety and mobility wherever State and local authorities have deemed it legal to ride on a bicycle.

In the NPA, FHWA proposed to add Support to Section 9A.01 stating that with few exceptions, such as when allowed to ride on a sidewalk or where some bicycle-specific traffic control devices are installed, bicycles are either legally defined as vehicles or a bicyclist is legally assigned the same rights and duties of an operator of a motor vehicle as governed by State and local law. The FHWA received several comments stating that the proposed Support language was overly broad and cited examples of where various State laws did not reflect what the proposed Support language was asserting.

The FHWA agrees with the commenters and revises the Support language to focus exclusively on bicyclist operation on roadways, rather than where it might be allowed on sidewalks or other facilities. The FHWA believes these provisions will help strengthen the protection of vulnerable users consistent with Section 11135 of BIL.

#### *Two-Stage Bicycle Turn Box*

The FHWA proposed to add a new Section in Chapter 9B on regulatory signing for Two-Stage Bicycle Turn Boxes that includes Support, Standard, and Options. The Standards defined conditions for which a two-stage turn box shall be provided and corresponding regulatory signs necessary to convey that information. The Option allowed for an appropriately sized Street Name sign to be installed with the All Turns From Bike Lane sign to identify the cross street where the turn box will be available.

Commenters suggested the proposed Standard defining specific conditions when a two-stage bicycle turn box is required be changed to Option and those conditions be modified to provide further clarity. Commenters also requested that the Standards requiring specific regulatory signs be used when bicyclists are being legally required to use a two-stage bicycle turn box be changed to Guidance. Similarly, commenters recommended the Standards requiring the mounting location of these regulatory signs also be changed to Guidance. Based on these comments and further review, FHWA changes the Standard that defined specific conditions when a two-stage bicycle turn box would be required to a Support statement that simply describes certain situations where a two-stage bicycle turn box can be used to facilitate bicycle turning movements. In alignment with this change, FHWA provides clarifying modifications to the description of those situations.

The FHWA retains the Standards requiring specific regulatory signs be used when bicyclists are required to use a two-stage bicycle turn box and the Standards requiring the appropriate mounting location of these signs. The FHWA retains these Standards to ensure bicyclists have this necessary regulatory information on the jurisdictional prescribed use of the bicycle turn box. These Standards will help ensure the safety of bicyclists and reduce conflicts between bicyclists and other traffic.

Also, to address a vehicle movement conflict that could compromise the safety of bicyclists, FHWA adds new Guidance that two-stage bicycle turn boxes should be

located outside of the path of right-turning vehicle traffic, and where a turn box is located within the path of right-turning vehicle traffic, a NO TURN ON RED (R10-11) sign should be used.

The FHWA believes these provisions will help strengthen the protection of vulnerable users consistent with Section 11135 of BIL.

#### *Bend-Outs at Intersections*

In the NPA, FHWA proposed to add Support, Option, and Guidance statements in Section 9E.02 related to the shifting of buffer-separated or separated bicycle lanes. The Option allows for bicycle lanes to be shifted closer to or further away from the adjacent general-purpose lane. The Guidance indicates the bicycle lanes should not be shifted away from the general-purpose lane unless there is sufficient space for a vehicle to queue between the general-purpose lane and extension of the bicycle lane.

Many commenters opposed the Guidance statement that a buffer-separated or separated bicycle lane should not be shifted away from the adjacent general-purpose lane at an intersection unless there is sufficient space for a vehicle to queue between the general-purpose lane and the extension of the bicycle lane. Commenters stated that it went counter to best practices and there was sufficient experience to show it to be safe practice. In consideration of the comments received and further review, FHWA is not adopting this proposed Guidance statement. Rather, FHWA is adding a Support statement that shifting a bicycle lane away from a general-purpose lane at an intersection can create space for vehicles to queue and has safety benefits. This change provides more flexibility and FHWA believes these provisions will help strengthen the protection of vulnerable users consistent with section 11135 of BIL.

#### *Counter-Flow Bike Lanes*

In the proposed new Section 9E.08 Counter-Flow Bicycle Lanes, FHWA proposed a Standard prohibiting locating a counter-flow bicycle lane between the



general-purpose lane and on-street parallel parking lane for motor vehicles. This prohibition was added due to safety concerns for bicyclists as a motorist may not have line of sight of oncoming bicyclists when maneuvering their parked vehicle to reenter the general-purpose travel way, which would require crossing the counter-flow bicycle lane with potentially very limited visibility.

Commenters suggested that the proposed Standard which would prohibit locating a counter-flow bike lane between a general-purpose lane and an on-street parallel parking lane would preclude situations when it is impractical to locate the lane elsewhere, such as between the curb and the parking lane. Commenters further suggested that locating the counter-flow bicycle lane between a general-purpose lane and an on-street parking lane has been done in a number of municipalities without documented safety issues.

The FHWA agrees that there may be situations where it would be impractical to locate a counter-flow elsewhere as local agencies may have limited options for creating and maintaining connected bicycle networks. However, placing bicycle lanes between the curb and an on-street parallel parking lane provides bicyclists a buffer from motor vehicle traffic to improve safety. Considering this, FHWA changes this Standard to Guidance, which will allow for engineering judgment or study to determine when it might be necessary to locate a counter-flow bike lane adjacent to the general-purpose lane. The FHWA believes this provides sufficient flexibility to agencies in designing their bicycle facilities while meeting FHWA's statutory obligation under Section 11135 of BIL to provide for the protection of vulnerable road users.

#### *Termination of Interim Approvals*

In addition to the changes adopted in the 11th Edition of the MUTCD, FHWA terminates the Interim Approvals for those provisional devices or applications that have been incorporated into this final rule, either in whole or part. Agencies that had received Interim Approval for those items listed are released from the requirement to maintain and

update a list of locations at which the provisional devices or applications have been implemented. Any future installations of the device or application previously subject to Interim Approval must comply with the provisions as stated in the 11th Edition of the MUTCD, and any provisions in the Interim Approval that conflict with the provisions adopted in the 11th Edition of the MUTCD are no longer valid. Existing installations that do not comply with the provisions adopted in the 11th Edition of the MUTCD must be brought into compliance by the compliance date established in this final rule, if applicable, or through systematic replacement and upgrade of traffic control devices if a compliance date is not specified. The following Interim Approvals are terminated with this final rule:

Interim Approval	Title	Date Issued
IA-5	Clearview Font for Positive-Contrast Legends on Guide Signs (Reinstated)	3/28/2018
IA-12	Traffic Signal Photo Enforced Signs	11/12/2010
IA-13	Alternative Electric Vehicle Charging General Service Symbol Sign	4/1/2011
IA-14	Green-Colored Pavement for Bike Lanes	4/15/2011
IA-15	Alternative Design for the U.S. Bicycle Route (M1-9) Sign	6/1/2012
IA-16	Bicycle Signal Faces	12/24/2013
IA-17	Three-Section Flashing Yellow Arrow Signal Faces	8/12/2014
IA-18	Intersection Bicycle Boxes	10/12/2016
IA-19	Alternative Signal Warrant 7 – Crash Experience	2/24/2017
IA-20	Two-Stage Bicycle Turn Boxes	7/23/2017
IA-21	Pedestrian-Actuated Rectangular Rapid-Flashing Beacons at Uncontrolled Marked Crosswalks	3/20/2018
IA-22	Red-Colored Pavement for Transit Lanes	12/4/2019

*Discussion Under 1 CFR Part 51*

The FHWA is incorporating by reference the more current versions of the manuals listed herein.

The FHWA's 2009 "Manual on Uniform Traffic Control Devices for Streets and Highways," including Revisions No. 1 and No. 2, dated May 2012, and No. 3 dated August 2022, are replaced with a new edition of the MUTCD (Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), 11th Edition, FHWA, December 2023). This document was developed by FHWA to define the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public travel.

The document that FHWA is incorporating by reference is reasonably available to interested parties, primarily State DOTs, local agencies, and Tribal governments carrying out Federal-aid highway projects. The text, figures, and tables of the new edition of the MUTCD incorporating the proposed changes from the current edition are available for inspection and copying, as prescribed in 49 CFR part 7, at FHWA Office of Transportation Operations, 1200 New Jersey Avenue, S.E., Washington, DC 20590. Further, the text, figures, and tables of the new edition of the MUTCD incorporating changes from the current edition are available on the MUTCD Website <http://mutcd.fhwa.dot.gov> and on the docket for this rulemaking. The specific details are discussed in greater detail elsewhere in this preamble.

### **Rulemaking Analysis and Notices**

### **Executive Order 12866 (Regulatory Planning and Review), Executive Order 13563 (Improving Regulation and Regulatory Review), and DOT Regulatory Policies and Procedures**

The FHWA has determined that this action is a significant regulatory action within the meaning of Executive Order (E.O.) 12866, as amended by the E.O. 14094. Most of the changes in this final rule provide additional guidance, clarification, and optional applications for traffic control devices. The FHWA believes that the uniform application of traffic control devices will greatly improve the traffic operations efficiency

and roadway safety. The Standards, Guidance, and Support are also used to create uniformity and to enhance safety and mobility at little additional expense to public agencies or the motoring public. The rule will not have an annual effect on the economy of \$200 million or more. For the substantive revisions for which costs can be quantified, along with the administrative costs, the total estimated cost measured in 2020 dollars is \$59.7 million when discounted to 2020 at 7 percent. A copy of the Economic Impact Assessment is available on the docket for this rulemaking. This rule will not adversely affect in a material way the economy, any sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, territorial, or Tribal governments or communities. These changes do not create a serious inconsistency with any other agency's action or materially alter the budgetary impact of any entitlements, grants, user fees, or loan programs.

### **Regulatory Flexibility Act**

In compliance with the Regulatory Flexibility Act (Pub. L. 96-354, 5 U.S.C. 601-612), FHWA has evaluated the effects of these changes on small entities and has determined that it is not anticipated to not have a significant economic impact on a substantial number of small entities. This final rule adds some alternative traffic control devices and only a very limited number of new or changed requirements. Most of the changes are expanded guidance and clarification information. This rule will primarily affect State and local governments and toll road authorities. The revisions directed by this action can be phased in by the States over specified time periods in order to minimize hardship. The changes made to traffic control devices that would require an expenditure of funds all have future effective dates sufficiently long to allow normal maintenance funds to replace the devices at the end of the material life-cycle. To the extent the revisions require expenditures by the State and local governments on Federal-aid

projects, they are reimbursable. The FHWA hereby certifies that this action will not have a significant economic impact on a substantial number of small entities.

### **Unfunded Mandates Reform Act of 1995**

This rule does not impose unfunded mandates as defined by the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4, 109 Stat. 48, March 22, 1995). The Unfunded Mandates Reform Act of 1995 (section 202(a)) requires agencies to prepare a written statement, which includes estimates of anticipated impacts, before proposing “any rule that includes any Federal mandate that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of \$100,000,000 or more (adjusted annually for inflation) in any one year.” The current threshold after adjustment for inflation is \$177 million, using the most current (2022) Implicit Price Deflator for the Gross Domestic Product. The revisions directed by this action can be phased in by the States over specified time periods in order to minimize hardship. The changes made to traffic control devices that would require an expenditure of funds all have future effective dates sufficiently long to allow normal maintenance funds to replace the devices at the end of the material life-cycle. To the extent the revisions require expenditures by the State and local governments on Federal-aid projects, they are reimbursable. This does not impose a Federal mandate resulting in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of \$177 million or more in any one year (2 U.S.C. 1532).

### **Executive Order 13132 (Federalism Assessment)**

E.O. 13132 requires agencies to ensure meaningful and timely input by State and local officials in the development of regulatory policies that may have a substantial, direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. The FHWA analyzed this action in accordance with the principles and

criteria contained in E.O. 13132 and determined that this action would not have sufficient federalism implications to warrant the preparation of a federalism assessment. The FHWA has also determined that this final rule would not preempt any State law or State regulation or affect the States' ability to discharge traditional State governmental functions.

#### **Executive Order 13175 (Tribal Consultation)**

The FHWA has analyzed this action under E.O. 13175 and determined that it will not have substantial direct effects on one or more Indian Tribes; will not impose substantial direct compliance costs on Indian Tribal governments; and will not preempt Tribal law. Therefore, a Tribal summary impact statement is not required.

#### **Executive Order 12898 (Environmental Justice)**

E.O. 12898 requires that each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minorities and low-income populations. FHWA has determined that this rule does not raise any environmental justice issues.

#### **Executive Order 12372 (Intergovernmental Review)**

The regulations implementing E.O. 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program. Local entities should refer to the Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction, for further information.

#### **Paperwork Reduction Act**

Under the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501, et seq.), Federal agencies must obtain approval from the Office of Management and Budget for each collection of information they conduct, sponsor, or require through regulations. The

FHWA has determined that this action does not contain collection information requirements for purposes of the PRA.

### **National Environmental Policy Act**

The FHWA has analyzed this action for the purpose of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*) and has determined that it will not have any significant effect on the quality of the environment and is categorically excluded under 23 CFR 771.117(c)(20), which applies to the promulgation of rules, regulations, and directives. Categorically excluded actions meet the criteria for categorical exclusions under the Council on Environmental Quality regulations and under 23 CFR 771.117(a) and normally do not require any further NEPA approvals by FHWA. The FHWA does not anticipate any adverse environmental impacts from this rule; no unusual circumstances are present under 23 CFR 771.117(b).

### **Regulation Identification Number**

A regulation identification number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross reference this action with the Unified Agenda.

### **List of Subjects**

#### **23 CFR part 470**

Grant programs-Transportation, Highways and roads.

#### **23 CFR part 635**

Grant programs-Transportation, Highways and roads, Reporting and recordkeeping requirements.

#### **23 CFR part 655**

Design standards, Grant programs—Transportation, Highways and roads, Incorporation by reference, Signs, Reporting and recordkeeping requirements, Traffic regulations.

Issued on under authority designated in 49 CFR 1.81:

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Shailen P. Bhatt  
Administrator  
Federal Highway Administration

In consideration of the foregoing, FHWA revises title 23, Code of Federal Regulations, parts 470, 635, and 655, as set forth below:

## **TITLE 23 – HIGHWAYS**

### **PART 470—HIGHWAY SYSTEMS**

1. Revise the authority citation for Part 470 to read as follows:

Authority: 23 U.S.C. 103(b)(2), 103(c), 134, 135, and 315; and 49 CFR 1.85.

#### **SUBPART A—Federal-aid Highway Systems**

2. Amend Appendix C to Subpart A of Part 470 by
  - a. Revising the section “Policy”;
  - b. Under “Conditions”, revising paragraph 5; and
  - c. Removing the section “Sign Details”.

The revisions read as follows:

#### **Appendix C to Subpart A of Part 470—Policy for the Signing and Numbering of Future Interstate Corridors Designated by Section 332 of the NHS Designation Act of 1995 or Designated Under 23 U.S.C. 103(c)(4)(B)**

##### **Policy**



State transportation agencies are permitted to erect informational signs along a federally designated future Interstate corridor only after the specific route location has been established for the route to be constructed to Interstate design standards.

**Conditions**

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5. Signing and other identification of a future Interstate route segment must comply with the provisions of the Manual on Uniform Traffic Control Devices for Streets and Highways.

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**PART 635—CONSTRUCTION AND MAINTENANCE**

3. The authority citation for part 635 continues to read as follows:

Authority: Sections 1525 and 1303 of Pub. L. 112-141, Sec. 1503 of Pub. L. 109-59, 119 Stat. 1144; 23 U.S.C. 101 (note), 109, 112, 113, 114, 116, 119, 128, and 315; 31 U.S.C. 6505; 42 U.S.C. 3334, 4601 et seq.; Sec. 1041(a), Pub. L. 102-240, 105 Stat. 1914; 23 CFR 1.32; 49 CFR 1.85(a)(1).

4. Amend § 635.309 by revising paragraph (o) to read as follows:

§ 635.309 Authorization.

\* \* \* \* \*

(o) The FHWA has determined that, where applicable, provisions are included in the PS&E that require the erection of funding source signs that comply with the Manual on Uniform Traffic Control Devices for Streets and Highways, for the life of the construction project, in accordance with section 154 of the Surface Transportation and Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (Pub. L. 91-646, 84 Stat. 1894; primarily codified in 42 U.S.C. 4601 et seq.;) (Uniform Act).

\* \* \* \* \*

**PART 655—TRAFFIC OPERATIONS**

5. Revise the authority citation for part 655 to read as follows:

**Authority:** 23 U.S.C. 101(a), 104, 109(d), 114(a), 217, 315, and 402(a); 23 CFR 1.32; and, 49 CFR 1.85.

6. Amend § 655.601 by revising paragraph (d)(2)(i) to read as follows:

**§ 655.601 Purpose**

\* \* \* \* \*

(d) \* \* \*

(2) \* \* \*

(i) Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), 11th Edition, FHWA, December 2023.

\* \* \* \* \*

7. Amend § 655.603 by revising paragraph (b)(1) to read as follows:

**§ 655.603 Standards**

\* \* \* \* \*

(b) \* \* \*

(1) Where State or other Federal agency MUTCDs or Supplements are required, they shall be in substantial conformance with the national MUTCD. Substantial conformance means that the State MUTCD or Supplement shall conform as a minimum to the Standard statements included in the national MUTCD. The FHWA Division Administrators and Associate Administrator for the Federal Lands Highway Program may grant exceptions in cases where a State MUTCD or Supplement cannot conform to Standard statements in the national MUTCD because of the requirements of a specific State law that was in effect prior to January 16, 2007, provided that the Division Administrator or Associate Administrator determines based on information available and documentation received from the State that the non-conformance does not create a safety

concern. The Guidance statements contained in the national MUTCD shall also be in the State MUTCD or Supplement unless the reason for not including it is satisfactorily explained based on engineering judgment, specific conflicting State law, or a documented engineering study. A State MUTCD or Supplement shall not contain Standard, Guidance, or Option statements that contravene or negate Standard or Guidance statements in the national MUTCD. In addition to a State MUTCD or Supplement, supplemental documents that a State issues, including but not limited to policies, directives, standard drawings or details, and specifications, shall not contravene or negate Standard or Guidance statements in the national MUTCD. The FHWA Division Administrators shall approve the State MUTCDs and Supplements that are in substantial conformance as defined heretofore with the national MUTCD. The FHWA Associate Administrator of the Federal Lands Highway Program shall approve other Federal land management agencies' MUTCDs and Supplements that are in substantial conformance as defined heretofore with the national MUTCD. The FHWA Division Administrators and the FHWA Associate Administrators for the Federal Lands Highway Program have the flexibility to determine on a case-by-case basis the degree of variation allowed in a State MUTCD or Supplement to accommodate existing State laws as described heretofore, for the express purpose of amending such laws over time.

8. Amend Appendix to Subpart F of Part 655 by:

- a. In paragraph 6 removing the word “nine” and adding in its place the word “ten”; and
- b. Adding Table 7.

The addition reads as follows:

Appendix To Subpart F of Part 655 – Alternate Method of Determining the Color of Retroreflective Sign Materials and Pavement Marking Materials

\* \* \* \* \*

Table 7 to Appendix to Part 655, Subpart F – Daytime Color Specification Limits for  
 Non-Retroreflective Materials Used for Colored Pavements

Color	Chromaticity Coordinates							
	1		2		3		4	
	x	y	X	y	x	y	x	y
Green	0.230	0.714	0.266	0.460	0.367	0.480	0.367	0.584
Red	0.420	0.330	0.450	0.380	0.560	0.370	0.540	0.320

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