

DEPARTMENT OF TRANSPORTATION**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: Proposed rule; notice of proposed amendments (NPA).

SUMMARY: The Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD) is incorporated in FHWA regulations and recognized as the national standard for traffic control devices used on all public roads. The purpose of this NPA is to revise standards, guidance, options, and supporting information relating to the traffic control devices in all parts of the MUTCD. The proposed changes are intended to update the technical provisions to reflect advances in technologies and operational practices, incorporate recent trends and innovations, and set the stage for automated driving systems as those continue to take shape. The proposed changes would promote uniformity and incorporate technology advances in the traffic control device application, and ultimately improve and promote the safe and efficient utilization of roads that are open to public travel. These proposed changes are being designated as the 11th edition of the MUTCD.

DATES: Comments must be received on or before March 15, 2021. Late-filed comments will be considered to the extent practicable.

ADDRESSES: To ensure that you do not duplicate your docket submissions, please submit them by only one of the following means:

- *Federal eRulemaking Portal:* Go to <http://www.regulations.gov> and follow the online instructions for submitting comments.
- *Mail:* Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Ave. SE, West Building Ground Floor Room W12–140, Washington, DC 20590–0001;
- *Hand Delivery:* West Building Ground Floor, Room W12–140, 1200 New Jersey Ave. SE, between 9 a.m. 5 p.m., e.t., Monday through Friday, except Federal holidays. The telephone number is (202) 366–9329;

• *Instructions:* You must include the agency name and docket number or the Regulatory Identification Number (RIN) for the rulemaking at the beginning of your comments. All comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided.

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

SUPPLEMENTARY INFORMATION:**Electronic Access and Filing**

This document and all comments received may be viewed online through the Federal eRulemaking portal at <http://www.regulations.gov>. The website is available 24 hours each day, 365 days each year. An electronic copy of this document may also be downloaded by accessing the Office of the Federal Register's home page at: <https://www.federalregister.gov>.

Executive Summary**I. Purpose of the Regulatory Action**

This regulatory action seeks to collect comments from the public on proposed revisions to the MUTCD. The proposed changes are intended to streamline processes and reduce burdens on State and local agencies by including many of the successful devices or applications that have resulted from over 180 official experiments that FHWA has approved, including congestion-reduction strategies such as variable speed limits, dynamic lane control and shoulder use, and pedestrian safety enhancements such as the rectangular rapid-flashing beacon.

The proposed changes would update the technical provisions to reflect advances in technologies and operational practices, incorporate recent trends and innovations, and set the stage for automated driving systems as those systems continue to take shape. These changes would promote uniformity and incorporate technological advances in traffic control device design and application, and ultimately improve and promote the safe and efficient utilization of roads that are open to public travel.

With this proposed rule, FHWA seeks to address any existing provisions that might have contributed to situations that inhibit or contravene the purpose of a nationwide standard for traffic control

devices, which is to promote the safe and efficient utilization of the highways and streets through an uninterrupted uniform system of signs, signals, and markings as road users travel between jurisdictions. Uniformity and consistency in message, placement, and operation of traffic control devices have been shown to address the expectancy of the road user, resulting in a more predictable response. 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.

II. Summary of the Major Provisions of the Regulatory Action in Question

Key proposed changes in this NPA 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;

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, new application of traffic control devices for part-time travel on shoulders to manage congestion, and new application of traffic control devices at busway crossings.

In addition, this regulatory action amends the following:

23 CFR part 470, subpart A, appendix C;

23 CFR 635.309(o); and
23 CFR 655.603(b)(1).

III. Costs and Benefits

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 agencies. The estimated national costs are documented in the economic analysis report titled, "Manual on Uniform Traffic Control Devices Assessment of Economic Impacts of Notice of Proposed Amendment," which is available on the docket.

The proposed rulemaking introduces a variety of revisions resulting in clarification of language and organization of the MUTCD, deregulation through increased flexibility and alternatives for agencies, deregulation through relaxation of standards 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.

This NPA provides quantitative estimates of the expected compliance costs associated with the proposed substantive revisions. There are 132 substantive revisions in total. There are 124 substantive revisions with minimal or no impact, including the introduction of 37 new traffic control device applications. These revisions materially change the MUTCD requirements but have no cost impacts or minimal cost impacts.

The remaining eight substantive revisions have quantifiable economic impacts. For the three substantive revisions for which costs can be quantified, the total estimated cost measured in 2018 dollars is \$541,978 when discounted to 2018 at 7 percent; and \$589,667 when discounted at 3 percent. These costs are estimated as the sum of 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 proposed 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 proposed revision includes a compliance date. For those proposed changes without a compliance date, the analysis assumes that agencies would make traffic control devices comply with the proposed revisions at the end of the service life of a device. For those proposed changes with a compliance date, the analysis assumes that agencies would upgrade non-

conforming traffic control devices through systematic upgrading, proportionally each year until the compliance date. The analysis period is 10 years starting with an implementation date of 2021 and extending through 2030. The costs of five 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 and any mobility impacts from efficient operation. Currently, no specific data or studies exist to measure operational benefits or efficiency gains, and these benefits are evaluated qualitatively. Ideally, safety benefits would be measured by the revision's impact on crashes, but there are no data that correlate the direct impact of traffic control devices with crash rates, and the safety benefits of these revisions could not be quantified. Potential safety benefits are evaluated qualitatively as well.

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

This rule is proposed under 23 U.S.C. 109(d), 315, and 402(a), which give the Secretary of Transportation the authority to promulgate uniform provisions to promote the safe and efficient utilization of the highways. This authority is delegated to FHWA under 49 CFR 1.85.

The text, figures, and tables of a proposed 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, SE, Washington, DC 20590. Further, the text, figures, and tables of a proposed new edition of the MUTCD incorporating changes from the current edition are available on the MUTCD website <http://mutcd.fhwa.dot.gov>. The proposed text

is available in two formats. The first format shows the current MUTCD text with proposed additions in blue underlined text and proposed deletions as red strikeout text, and also includes notes in green boxes to provide helpful explanations where text is proposed to be relocated or where minor edits are proposed. The second format shows a "clean" version of the complete text proposed for the next edition of the MUTCD, with all the proposed changes incorporated. Though the proposed text, figures, and tables are available only as separate documents for inspection, all three elements will be integrated when the new edition of the MUTCD is published in a consistent format, similar to the current edition. The complete current 2009 edition of the MUTCD with Revision No. 1 and Revision No. 2 incorporated is also available on the same website.

This NPA is being issued to provide an opportunity for public comment on the desirability of these proposed amendments to the MUTCD. This NPA does not address the proposals contained in FHWA's ongoing rulemaking titled, "Maintaining Pavement Marking Retroreflectivity," (RIN 2125-AF34; Docket No. FHWA-2009-0139) at 82 FR 770 (January 4, 2017). Based on the comments received and its own experience, FHWA may issue a final rule concerning the proposed changes included in this document.

The NPA is being published to address the many advances in technology, research results, and improved traffic and safety management strategies that have occurred since the 2009 edition of the MUTCD. FHWA invites comments on these proposed changes to the MUTCD. FHWA requests that commenters cite the page number and line numbers of the proposed MUTCD text for which each specific comment to the docket about the proposed text is concerned, to help make FHWA's docket comment review process more efficient. A form is provided on the docket to simplify the comment submission process. FHWA requests that commenters download and utilize this form to submit comments to the docket, but it is not required.

A summary of the proposed general changes and proposed changes for each of the parts of the MUTCD is included in the following discussion. In general, the proposed changes are based on the goal of achieving uniformity in the appearance, meaning, application, and other critical attributes of traffic control devices to promote the safe and efficient utilization of the streets and highways. 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 which, in turn, results in a safer, more efficient operation of the roads nationwide. It is under this premise that the provisions of the MUTCD are developed and promulgated. These proposals are based on the best available research, professional judgment, and data demonstrating that road user confusion would be avoided had a non-uniform traffic control device been uniform. Where this NPA proposes regulatory requirements prescribing specific conduct that regulated entities must adopt, FHWA has determined that these regulations are necessary to address the compelling need for nationwide uniformity to ensure the safety and efficiency of the traveling public.

Discussion of Proposed Amendments to Part 1 General

1. As part of the reorganization, FHWA proposes to delete the existing Introduction and relocate most of that material into a proposed expanded/restructured Part 1. The purpose of this consolidation is to present more logically the general information about the MUTCD and traffic control devices and to eliminate duplicative material that appears in both the Introduction and sections of Part 1. As a part of this change, FHWA also proposes to remove the existing text and table regarding the historical development of the MUTCD and paragraphs pertaining to the use of metric units, as this material is not needed in the MUTCD or can be instead posted on the MUTCD website for those who are interested in it.

In addition to the changes described herein and shown in the proposed text of the MUTCD, FHWA proposes a new format for each specific traffic control device that is consistent with the format currently used in Part 4 of the Manual, which uses all upper-case letters for each type of traffic signal indication (e.g., “CIRCULAR RED signal indication”). For example, the title of a sign would be shown in the MUTCD as “SPEED LIMIT sign” instead of “Speed Limit sign,” “CHEVRON ALIGNMENT sign” instead of “Chevron Alignment sign,” and “EXIT DIRECTION sign” instead of “Exit Direction sign.” (The sign title would not depend on whether any word legend on a sign is displayed in upper-case or upper- and lower-case letters.) A similar format would be used for pavement markings: “NORMAL WIDTH DOTTED WHITE lane line” instead of “normal width dotted white lane line,” “WIDE SOLID WHITE line”

instead of “wide solid white line,” “DOUBLE SOLID YELLOW line” instead of “double solid yellow line,” and “CHEVRON HATCH markings” instead of “chevron hatch markings.” This proposed change is not shown in the proposed text of the MUTCD, but would be incorporated in the new edition of the MUTCD if adopted in the Final Rule. FHWA requests comment on this reformatting proposal for implementation throughout the entire Manual.

2. In the proposed consolidated Part 1, FHWA proposes to reorganize the retained material from the existing Introduction and existing Part 1 into four new chapters, to create a more logical flow of information and make it easier for users to find the content they need. The four chapters of the new Part 1 are Chapter 1A (General), Chapter 1B (Legal Requirements for Traffic Control Devices), Chapter 1C (Definitions, Acronyms, and Abbreviations Used In This Manual), and Chapter 1D (Provisions Applicable to Traffic Control Devices in General).

3. In Chapter 1A General, FHWA proposes to create Section 1A.01, titled, “Purpose of the MUTCD,” with new text recommended by Item 525 of the 20-Year Vision and Strategic Plan for the MUTCD.¹ FHWA proposes this revision because a clear statement of the MUTCD’s purpose is critical in defining what content should be in the MUTCD and how that content should be used.

4. In Section 1A.02 (existing Section 1A.01), FHWA proposes to retitle the section to “Traffic Control Devices—Definition.” FHWA also proposes to change the Standard (relocated from the Introduction, Paragraph 1) to Support, restating and referring to the definition of “traffic control devices” (as proposed to be revised in Section 1C.02). FHWA also proposes to add a new Support paragraph about infrastructure elements and certain operational devices, to explain that these are not considered traffic control devices. FHWA proposes these revisions to align proposed content and material being relocated from the Introduction and from other sections within existing Part 1.

FHWA also proposes to include a new list item (labeled “F”), stating that messages displayed on changeable message signs for America’s Missing: Broadcast Emergency Response (AMBER) alerts and homeland security

information during declared states of emergency are not being considered as traffic control devices and, therefore, provisions regarding their design and use are not included in the MUTCD. FHWA proposes this revision because these two types of messages are specific exceptions to the use of a traffic control device expressly allowed by statute. They are referenced in the MUTCD because the device on which they are displayed is a traffic control device, even though the specific messages are not traffic control device messages.

Lastly, FHWA proposes to relocate the Standard and Support pertaining to advertising to Section 1D.09. FHWA proposes this revision to align proposed content and material in each Section.

5. FHWA proposes to add a new Section 1A.03, titled, “Target Road Users,” with new text recommended by Item 526 of the 20-Year Vision and Strategic Plan for the MUTCD.² The proposed text describes the characteristics of the two groups of target road users for traffic control devices—operators of vehicles (including bicyclists) and pedestrians. FHWA proposes this revision because proper use of traffic control devices can be optimized by stating the expectations for road users responding to the traffic control devices.

6. FHWA proposes to add a new Section 1A.04, titled, “Use of the MUTCD,” with two new Standard paragraphs and one new Guidance paragraph consisting of text recommended by items 528 and 529 of the 20-Year Vision and Strategic Plan for the MUTCD, plus additional text relocated from the Introduction.³ The proposed text establishes minimum qualifications for those responsible for performing traffic control device activities in order to reduce the potential for unqualified individuals performing traffic control device activities, specifically recommending that traffic control device decisions should be made with consideration of multiple factors.

Lastly, FHWA proposes to change Support paragraphs to provide clarity and to reflect the new use of unnumbered sub-chapter headings.

7. In Section 1A.05 (existing Section 1A.11) Relation to Other Publications, FHWA proposes to add three additional publications to the list of useful sources of information (“Manual for Assessing Safety Hardware” 2009 Edition

¹ “20-Year Vision and Strategic Plan for the Manual on Uniform Traffic Control Devices,” National Committee on Uniform Traffic Control Devices, January 9, 2014, can be viewed at the following internet website: <http://nctcd.org/wp-content/uploads/MUTCD/MUTCD-20-Year-Vision-NCUTCD-Appvd-1-9-14-FINAL.pdf>.

² “20-Year Vision and Strategic Plan” can be viewed at the following internet website: <http://nctcd.org/wp-content/uploads/MUTCD/MUTCD-20-Year-Vision-NCUTCD-Appvd-1-9-14-FINAL.pdf>.

³ *Ibid.*

AASHTO, "Equipment and Materials Standards of the Institute of Transportation Engineers" 1988 Edition ITE, and "Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement" 2007 Edition ITE). FHWA also proposes to delete four publications from the existing list of useful sources of information ("Roundabouts—An Informational Guide (FHWA-RD-00-067)" 2000 Edition FHWA, "Purchase Specification for Flashing and Steady Burn Warning Lights" 1981 Edition ITE, "Traffic Detector Handbook" 1991 Edition ITE, and "Traffic Signal Lamps" 1980 Edition ITE). Lastly, FHWA proposes to update several of the listed publication editions. FHWA proposes these revisions to reflect the most current and applicable supporting publications and to delete any references to publications that are obsolete or have been superseded. In concert with this change, FHWA also proposes Standard and Support paragraphs to explain how specific editions of the resources listed apply to the new edition of the MUTCD.

8. FHWA proposes to add a new Section 1A.06, titled, "Uniform Vehicle Code—Rules of the Road," with text relocated from the existing Introduction and from existing Section 1A.02, plus additional new Support text to explain the current status of the Uniform Vehicle Code. FHWA proposes these revisions to provide clear guidance on the application of the Uniform Vehicle Code.

9. FHWA proposes to add a new Section 1B.01, titled, "National Standard," with text relocated from the existing Introduction. As a part of this change, FHWA proposes to revise existing Paragraph 2, Sentence 2, of the Introduction, from a Standard to a Support, as it is a statement of fact rather than a mandate of the MUTCD.

Lastly, FHWA proposes to add a new Standard indicating the types of facilities to which the MUTCD shall apply and not apply, per 23 CFR 655.603(a). FHWA proposes this revision to make the MUTCD easier for users to understand its applicability, particularly for smaller agencies and individual owners of roads open to public travel.

10. FHWA proposes to add a new Section 1B.02, titled, "State Adoption and Conformance," with text relocated from the existing Introduction and existing Section 1A.07. FHWA proposes this revision to consolidate information about the adoption of the MUTCD by States and other Federal agencies and substantial conformance of State MUTCDs and Supplements.

FHWA also proposes a new Standard paragraph to clarify the fact that, in addition to State MUTCDs or Supplements, any policies, directives, or other supplemental documents that a State or other agency might issue to address traffic control devices are considered supplements to the MUTCD and must be in substantial conformance with the national MUTCD. This proposed change is for clarification purposes and does not represent a change to existing requirements.

Lastly, FHWA proposes to add Guidance indicating that traffic control devices that have been granted Interim Approval, but which have not yet been adopted into the national MUTCD, should not be included in State MUTCDs or Supplements. FHWA proposes this revision to clarify the process for such cases because the technical conditions or status of an Interim Approval are provisional in nature and can change before adoption into the MUTCD. Adoption into State Manuals or Supplements can create a burden for those States for which a legislative change would be required to comply with any new or revised provisions that FHWA might issue. FHWA proposes this change to ensure that an Interim Approval can accommodate flexibility by responding readily to any changes that might become necessary.

11. FHWA proposes to add a new Section 1B.03, titled, "Compliance of Devices," with text relocated from the existing Introduction and existing Sections 1A.07 and 1A.10. FHWA proposes this revision to consolidate information regarding the compliance of traffic control devices to streamline and improve the usability of the MUTCD.

FHWA also proposes to revise an existing Standard relocated from Section 1A.07 to Support. FHWA proposes this revision since the statement is of fact rather than a mandate of the MUTCD.

FHWA also proposes to add a new Support paragraph clarifying the status of devices or applications not specifically addressed in the Manual. FHWA proposes this revision to address a common misperception that an application of a device is allowed if it is not explicitly prohibited in the Manual, even if that application is not addressed in the Manual. In those cases in which there might be some question as to whether an application that is not specifically mentioned in the MUTCD might be allowed, an individual is encouraged to seek an official interpretation, in which FHWA can evaluate whether such application is consistent with the provisions for that

device and whether it would adversely impact uniformity.

FHWA also proposes to combine a Standard paragraph and an Option paragraph regarding the replacement of non-compliant traffic control devices, relocated from the Introduction, into a single Standard. FHWA proposes this revision to streamline existing language.

FHWA also proposes to remove 12 rows in Table 1B-1 (existing Table I-2), titled, "Target Compliance Dates Established by the FHWA." FHWA proposes this revision since these rows contain requirements with previously established compliance dates that have passed or will have passed by the date of the publication of the Final Rule resulting from this NPA. Related to this proposed change, FHWA proposes to delete additional compliance dates from the table that are in effect at the time this NPA is published, but expire prior to the effective date of the Final Rule.

FHWA also proposes to add three new compliance dates to Table 1B-1 (existing Table I-2). For Section 2C.25 Low Clearance Signs, the compliance date of five years from the effective date of the final rule for this edition applies to the proposed new Standard requiring that if used, Low Clearance Overhead signs shall indicate the portion of the structure with low clearance if the posted clearance does not apply to the entire structure to indicate the point of applicability. The proposed changes were based on recommendations from the National Transportation Safety Board (NTSB) H-14-11⁴ to provide signing indicating the proper lane of travel for over height vehicles traveling under an arched structure.

For Section 8B.16 High-Profile Grading Crossings, the compliance date of five years from the effective date of the final rule for this edition applies to the proposed new Guidance recommending the installation of Low Ground Clearance and/or Vehicle Exclusion and detour signs for vehicles with low ground clearances that might hang up on high-profile grade crossings. The proposed compliance date applies only to those locations with known histories of vehicle hang-ups occurring because sufficient geometric criteria do not currently exist by which agencies could evaluate crossings to determine the specific types of vehicles that could be problematic. The proposed changes were based on recommendation from

⁴ The NTSB report can be viewed at the following internet website: <https://www.nts.gov/investigations/AccidentReports/Reports/HAR1401.pdf>.

NTSB H-18-24⁵ to provide signing for high-profile grade crossings.

For Section 8D.10 through 8D.13 Highway Traffic Signals at or Near Grading Crossings, the compliance date of ten years from the effective date of the final rule for this edition applies to the determination and installation of the appropriate treatment (preemption, movement prohibition, pre-signals, or queue cutter signals) at highway-rail grade crossings in close proximity to signalized intersections. FHWA proposes this compliance date due to the high potential for train-vehicle crashes at locations where a vehicle traveling in a platoon can come to a stop on a crossing unintentionally due to a queue from a downstream signalized intersection.

12. FHWA proposes to replace existing Section 1A.10 with seven new Sections numbered from 1B.03 through 1B.09. The seven new Sections are Section 1B.03 (Compliance of Devices), Section 1B.04 (Issuance of Official Rulings Related to this Manual), Section 1B.05 (Official Interpretations), Section 1B.06 (Experimentation), Section 1B.07 (Changes to the MUTCD), Section 1B.08 (Interim Approvals), and Section 1B.09 (Requesting Official Interpretations, Experiments, Changes to the MUTCD, or Interim Approvals). FHWA proposes this revision to improve the organization of material regarding official interpretations, experimentations, changes to the MUTCD, interim approvals, and procedures for requesting any of these actions.

13. In proposed Section 1B.06 Experimentation, FHWA proposes to revise existing Section 1A.10, Paragraph 11, and change from Guidance to Standard. In addition, FHWA proposes to add Standards, Support, and Guidance paragraphs further addressing the experimentation process. FHWA proposes these revisions to clarify and streamline the experimentation process for agencies wishing to experiment with novel traffic control devices or applications.

14. In proposed Section 1B.08 Interim Approvals, FHWA proposes to revise existing Section 1A.10, Paragraph 18, and change from Guidance to Standard. FHWA proposes this revision to clarify and streamline the interim approval process.

15. In proposed Section 1B.09 Requesting Official Interpretations, Experiments, Changes to the MUTCD, or

Interim Approvals, FHWA proposes to add Support paragraphs to provide further clarity on official rulings.

16. In proposed new Chapter 1C Definitions, Acronyms, and Abbreviations Used in this Manual, FHWA proposes to replace existing Section 1A.13 with two new Sections. Section 1C.01, titled, "Definitions of Headings Used in this Manual" would cover definitions of the headings used in the MUTCD (such as Standard, Guidance, etc.). Section 1C.02, titled, "Definitions of Words and Phrases Used in this Manual" would cover definitions of the words and phrases used in the MUTCD. FHWA proposes this revision to provide clarity between definitions of the headings and definitions of words and phrases used throughout the Manual.

FHWA also proposes to revise the definition of a Standard in Section 1C.01 to indicate that in limited cases, the results of a documented engineering study might indicate that a deviation from one or more requirements of a Standard provision to be appropriate. FHWA proposes this revision based on Official Ruling No. 1(09)-1(I).⁶

17. In proposed Section 1C.02 Definitions of Words and Phrases Used in this Manual, FHWA proposes to revise the existing definitions for the following: "active grade crossing warning system," "actuated operation," "actuation," "channelizing line markings," "constant warning time train detection," "conventional road," "crashworthy," "delineator," "emergency-vehicle traffic control signal," "engineering judgement," "engineering study," "flashing," "full-actuated operation," "highway traffic signal," "in-roadway lights," "intersection," "logo," "median," "minimum track clearance distance," "overhead sign," "parking area," "paved," "pedestrian clearance time," "pedestrian facility," "pictograph," "preemption," "pre-signal," "private road open to public travel," "queue clearance time," "quiet zone," "raised pavement marker," "road user," "semi-actuated operation," "sign," "sign panel," "sequence of indications," "statutory speed limit," "traffic," "traffic control device," "traffic control signal (traffic signal)," and "worker." FHWA proposes these revisions to reflect accepted practice and terminologies, and for consistency in the usage of these terms in the MUTCD. The proposed revision to the definition

of "engineering study" is a specific recommendation of Item 531 of the 20-Year Vision and Strategic Plan for the MUTCD.⁷

FHWA also proposes to add definitions for the following: "active grade crossing," "agency," "application," "bicycle signal face," "bicycle symbol signal indication," "blank-out sign," "busway," "diagnostic team," "driveway," "driving aisle," "dynamic message sign," "engineer," "exclusive alignment," "fail-safe," "four-quadrant gate system," "general-purpose lane," "gore area," "identification marker," "jughandle turn," "loading zone," "low-volume rural road," "mixed-use alignment," "on-street parking," "option lane," "parking space," "professional engineer (P.E.)," "queue cutter signal," "reconstructed," "rectangular rapid-flashing beacon," "right-of-way, public highway," "semi-exclusive alignment," "serviceable," "shoulder," "sidewalk grade crossing," "signal dimming," "site roadways open to public travel," "swing gate," "through train," "toll road (facility)," "uncontrolled approach," and "variable message sign." FHWA proposes these revisions because these terms either are used or are proposed for use in the MUTCD.

In addition, FHWA proposes to delete the existing definitions for the following: "advance preemption," "advance preemption time," "average day," "cantilevered signal structure," "concurrent flow preferential lane," "end of roadway marker," "interval sequence," "maximum highway traffic signal preemption time," "minimum warning time," "right-of-way transfer time," "simultaneous preemption," and "wayside equipment." FHWA proposes these revisions because these terms are either proposed for deletion from the Manual as part of this document or used only once in a specific section of the Manual.

FHWA also proposes to delete the definition for "safe-positioned" and relocate this information to Part 6. FHWA proposes this revision because this term is only used in that Part of the MUTCD.

FHWA also proposes to delete the definitions for "average day," "cantilevered signal structure," "concurrent flow preferential lane," and "end-of-roadway marker." FHWA proposes these revisions because these

⁵ The NTSB report can be viewed at the following internet website: <https://www.nts.gov/investigations/AccidentReports/Reports/HAR1801.pdf>.

⁶ Official Ruling No. 1(09)-1(I), dated October 1, 2010, can be viewed at the following internet website: <https://mutcd.fhwa.dot.gov/regdetails.asp?id=30>.

⁷ "20-Year Vision and Strategic Plan for the Manual on Uniform Traffic Control Devices," National Committee on Uniform Traffic Control Devices, January 9, 2014, can be viewed at the following internet website: <http://ncutcd.org/wp-content/uploads/MUTCD/MUTCD-20-Year-Vision-NCUTCD-Appvd-1-9-14-FINAL.pdf>.

terms are not used anywhere in the MUTCD.

18. In Section 1C.03 (existing Section 1A.14), retitled, “Meanings of Acronyms and Abbreviations Used in this Manual,” FHWA proposes to delete the acronyms/abbreviations “EPA” and “TDD” and relocate the information to Part 2. FHWA proposes these revisions because these terms are only used in that Part of the MUTCD.

FHWA also proposes to delete the acronyms/abbreviations “HOT,” “HOTM,” “HOTO,” “PCMS,” and “RRPM.” FHWA proposes these revisions because the terms are not used in the MUTCD text.

Lastly, FHWA proposes to add the abbreviations “cd/lx/m²,” “ft,” “in,” and “mi.” FHWA proposes these abbreviations because these abbreviations for light intensity and distances are used throughout the MUTCD.

19. In Section 1D.01 (existing Section 1A.02), retitled, “Purpose and Principles of Traffic Control Devices,” FHWA proposes to revise the title to reflect the content with the proposed relocation of a paragraph from existing Section 1A.01 to this section. Also, FHWA proposes to revise the Guidance about what makes a traffic control device effective by changing “meet five basic requirements” to “be consistent with these principles.” FHWA proposes these revisions to clarify that the principles are recommendations rather than requirements, as they are contained within a Guidance provision.

In addition, FHWA proposes to add a new Standard indicating that traffic control devices used on site roadways open to the public shall have the same shape, color, and meaning as those required by the MUTCD, unless exceptions are noted in the Manual.

20. FHWA proposes to add a new Section 1D.02, titled, “Traffic Control Device Characteristics and Activities,” with new text recommended by Item 527 of the 20-Year Vision and Strategic Plan for the MUTCD.⁸ The proposed text describes seven characteristics and activities associated with traffic control devices. FHWA proposes this revision since clarifying distinctions between types of traffic control device activities would assist agencies in establishing the qualifications needed to perform the selected activities.

21. FHWA proposes to combine existing Sections 1A.07 and 1A.08 into

a single Section 1D.04, titled, “Responsibility and Authority for Traffic Control Devices.” With this revision, FHWA proposes to delete the last two sentences of Paragraph 1 as this text is redundant with Section 1B.

FHWA also proposes to relocate several existing paragraphs since they better align with content presented in other Sections.

FHWA also proposes to delete an existing Support paragraph since all States have a law on the adoption of, and have adopted, the MUTCD.

FHWA also proposes to delete an existing Guidance paragraph since this text is redundant to paragraphs contained in other Sections.

FHWA also proposes to revise an existing Standard paragraph to change the word “advertisements” to “public announcements or notices” because the existing term can be misinterpreted to refer only to announcements of a commercial nature.

In addition, FHWA proposes to delete an existing Guidance paragraph because the Standard paragraphs in this and other sections define (1) the authorization for placement and, by inference, removal of traffic control devices; and (2) the criteria or warrants for the installation of traffic control devices.

Lastly, FHWA proposes to add two additional Support paragraphs to emphasize further that the highway right-of-way is reserved for highway related purposes in accordance with 23 CFR 1.23(b), and that States may adopt restrictions on outdoor advertising that resembles official traffic control devices, which is required by 23 CFR 750.180 in certain cases.

22. In Section 1D.05 (existing Section 1A.09) Engineering Study and Engineering Judgment, FHWA proposes to revise existing Support paragraphs. FHWA proposes this revision based on Official Ruling No. 1(09)–1(I),⁹ and to emphasize a clear understanding of the application of engineering studies and engineering judgement in this Manual.

23. In Section 1D.06 (existing Section 1A.03) Design of Traffic Control Devices, FHWA proposes to revise existing Guidance to clarify that a traffic control device’s design should be modified only in unusual circumstances based on an engineering study or engineering judgment.

FHWA also proposes to add a new Standard requiring that shapes that are exclusive to a particular sign, such as

the octagon for the STOP sign, shall not be obscured by another sign mounted on the back of the assembly. This proposed change is consistent with existing provisions in proposed Section 2B.18 (existing Section 2B.10). FHWA proposes this revision to ensure that sign shapes that are of critical importance are easily recognized, because their unique shapes instantly convey a unique message to road users.

Lastly, FHWA also proposes to add a new Standard indicating that colors shall be consistent across the face of a sign or panel, and that color gradients shall not be allowed. FHWA proposes this revision to provide clarification due to the technological capabilities of sign printers, which have entered the market in just the last few years.

24. In Section 1D.07 (existing Section 1A.12) Color Code, FHWA proposes to add a Standard indicating that colors shall be used only as prescribed in this Manual for specific devices or applications. FHWA proposes this revision to clarify that the listed color definitions are general designations and do not mean that any color can be applied in any combination or orientation for non-standard signs. This proposed change is for clarification purposes and does not represent a change to existing requirements.

25. FHWA proposes to create a new Section 1D.08, titled, “Public Domain, Copyrights, and Patents,” with new Standard and Support paragraphs. FHWA proposes this revision to clarify the existing provisions on this topic with respect to traffic control devices, and that the meaning, appearance, operation, and application of traffic control devices as a road user experiences them shall not be protected by a patent, trademark, or copyright due to its adverse impact on the very uniformity the MUTCD is intended to promote. However, their method of assembly, their method of manufacture, and their component parts can be, and often are, protected.

Uniformity in the display of traffic control devices is central to the underlying foundation of the MUTCD. As such, FHWA establishes the criteria therein with uniformity in mind, including a limitation on patents, trademarks, and copyrights associated with traffic control devices. This limited prohibition on intellectual property associated with a traffic control device is stated in the MUTCD to be associated with the device’s “design and

⁸ “20-Year Vision and Strategic Plan for the Manual on Uniform Traffic Control Devices,” National Committee on Uniform Traffic Control Devices, January 9, 2014, can be viewed at the following internet website: <http://nctcd.org/wp-content/uploads/MUTCD/MUTCD-20-Year-Vision-NCUTCD-Appvd-1-9-14-FINAL.pdf>.

⁹ Official Ruling No. 1(09)–1(I), dated October 1, 2010, can be viewed at the following internet website: <https://mutcd.fhwa.dot.gov/reqdetails.asp?id=30>.

application provision contained in [the] Manual.”¹⁰

FHWA occasionally receives requests to approve patented traffic control device concepts for potential open-road experimentation under the MUTCD provisions, with the ultimate intent of having the devices adopted in the provisions of the MUTCD through rulemaking. FHWA believes that those involved in the development of new traffic control devices, as well as highway agencies being requested to experiment with these devices, could benefit from further clarification of the term “design and application provision” of a traffic control device as provided for in the MUTCD, to understand better which aspects of devices can be patented, trademarked, or copyrighted.

In addition, FHWA continues to receive inquiries related to its recent rulemaking¹¹ that rescinded regulations related to the procurement of patented or proprietary products on highway projects, which did not change the patent provisions of the MUTCD. Some stakeholders believed that the removal of restrictions on the procurement of patented or proprietary products either did extend or should have extended to the patent provisions of the MUTCD as well. However, the limitation in the MUTCD is based on uniformity and its purpose is separate and distinct from 23 CFR 635.411, which addresses the procedures for the procurement of proprietary products in highway construction using Federal-aid funds. The MUTCD limitation on proprietary products necessarily excludes proprietary traffic control devices which claim protection on the message conveyed. The purpose of this limitation is to ensure uniformity in the message. However, any other aspects of a device may be patented so long as the appearance, audible message, or other aspects of the message conveyed remain freely reproducible by all without infringing on any proprietary rights or interests.

The proposed MUTCD language, along with this document, provides further clarification and background on this subject matter. The information clarifies what aspects of a traffic control device can and cannot be patented or otherwise protected. In general, the component parts of a traffic control device may be patented or otherwise protected, but how the device is to appear and operate to the observer (*i.e.*, how it would be specified in the

MUTCD) must remain in the public domain and must not be covered by any patent that would preclude others from freely producing the traffic control device. As a result, the road user will always experience the same traffic control device for similar conditions in the same way.

The purpose of addressing this aspect of traffic control devices is due to the adverse effect that protections on what the road user experiences would have on uniformity in the message to the road user. By virtue of patent or other protections on the message itself, alternate messages would have to be allowed to address the same conditions so as not to include infringement by competitors.

Based on the varying views that the public has expressed in the past on this topic, FHWA requests that commenters provide sufficient detail and explanation of how the proposal or alternatives would support both uniformity and cost-effectiveness of traffic control devices, and enable their manufacture without infringement on protections enjoyed by patent holders. Specific references should be made to the proposed MUTCD text and to the explanation provided in this document.

26. FHWA proposes to create a new Section 1D.09 Advertising, with text relocated from existing Section 1A.01. In this Section, FHWA proposes to add Acknowledgment signs to the existing items that are not considered advertising, consistent with existing text in Part 2 for that type of sign.

27. In Section 1D.10 (existing Section 1A.15) Abbreviations Used on Traffic Control Devices, FHWA proposes to revise an existing Guidance paragraph to be consistent with the notes in Table 1D-2 (existing Table 1A-2).

28. In Section 1D.11 (existing Section 1A.04) Placement and Operation of Traffic Control Devices, FHWA proposes to add a Standard statement that, before any new highway, site roadway open to public travel, detour, or temporary route is opened to public travel, all necessary traffic control devices shall be in place. FHWA proposes this revision to consolidate similar Guidance text in existing Section 3A.01 regarding markings and similar Standard text in existing Section 6B.01 regarding signs, and because it is important that all necessary traffic control devices be in place before new roads, detours, or temporary routes are opened to public travel.

Discussion of Proposed Amendments to Chapter 2A Signs—General

29. In Section 2A.01 Function and Purpose of Signs, FHWA proposes to

delete existing P3 referencing definitions for various roadway types, because the information is repetitive and not necessary.

FHWA also proposes to revise this Section to expand on the language from existing P1 regarding the use of signs on a frequent basis to confirm rules of the road or statutes. FHWA proposes a new Guidance provision recommending that agencies use temporary signs when determined necessary to advise of new regulations or as part of an educational campaign. FHWA also adds a recommendation on the placement of permanent signs for rules of the road in adjacent jurisdictions. FHWA proposes this new paragraph to limit the amount of signing along a given route to reduce sign clutter and the informational load imposed on the road user and to reduce sign maintenance burdens on the responsible maintaining agency.

30. In Section 2A.02 (existing Section 2A.03) Standardization of Application, FHWA proposes to add a Support paragraph relocating certain information from existing Part 5 regarding the use of traffic control devices on low-volume rural roads. FHWA proposes to redistribute the provisions of existing Part 5 among the remaining parts.

FHWA also proposes to delete the second sentence of the Standard paragraph because the statement is redundant and is implied throughout the Manual.

31. In Section 2A.04 (existing Section 2A.06) Design of Signs, FHWA proposes to eliminate the provision in the existing Standard P8 that allows for minor changes to the proportion of symbols. FHWA proposes this change because symbol designs are standardized for recognition based on the specific proportions of the symbol, and this statement contradicts the subsequent standard.

FHWA also proposes to delete the existing Option P10 because the subject of orientation is addressed in Section 2A.09 (existing Section 2A.12).

FHWA also proposes to add a new Standard to clarify that, except where explicitly allowed, the substitution of a word legend for a symbol legend is prohibited where the standard sign legend uses the specific symbol, as it contravenes uniformity in recognition and messaging to road users. This proposed change is for clarification purposes and does not represent a change to existing requirements, and is consistent with changes included in the 2009 MUTCD, which discontinued a number of alternate standard signs with word legends for which the primary standard sign included a symbol legend.

¹⁰ From the Introduction, Paragraph 4, 2009 MUTCD, which is available at the following internet website: <https://mutcd.fhwa.dot.gov/>.

¹¹ 84 FR 51023 (September 27, 2019).

FHWA proposes to add a new Standard that prohibits an alternative sign design or dimensions when there is a standard sign provided in the Manual or detailed in the “Standard Highway Signs” publication, except where specifically allowed. FHWA also proposes a related Standard for standardized sign layouts that might have a variable length legend, but otherwise have a standard dimension. FHWA proposes this change because the standardized designs are often of recognizable form as well as message.

FHWA also proposes to add a Support paragraph regarding the use of special word legend signs that may be unclear to road users. FHWA proposes this addition to encourage evaluation of such signs to determine comprehension or possible misinterpretation.

FHWA proposes to delete Guidance P15 and revise Standard P14 that describes provisions related to the range of allowable information and graphical symbols affixed to the face and back of a sign. FHWA updates this paragraph to reflect similar forms of information to those listed in the existing P14 and proposes to prohibit the following additional items unless otherwise specified for a specific sign: Telephone numbers, metadata tags (“hash-tags”), quick-response (QR) codes, bar codes, or other graphics for optical scanning. In conjunction with this change, FHWA proposes to revise Option P16 to allow for the use of these items for signs that are intended and oriented for viewing by pedestrians only. FHWA proposes these changes to consolidate like information.

FHWA proposes to revise the Standard regarding pictographs to require that they be devoid of QR codes, bar codes, or other graphics designed for optical scanning for the purpose of obtaining information to be consistent with the Standard language described above.

FHWA proposes to add a Standard to clarify the existing prohibition of Business Identification (formerly Logo) sign panels from being displayed on signs except as specifically provided in the Manual. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement.

FHWA proposes to reiterate and expand the existing Standard from Section 2B.10 prohibiting items other than traffic control signs from being mounted on the back of a sign.

FHWA proposes to add an Option permitting the display of date of fabrication, sign designation, sign size, and manufacturer name on the front of a sign face, as well as a Standard

specifying the location, maximum letter heights, and letter color.

32. In Section 2A.05 (existing Section 2A.09) Shapes, FHWA proposes to add a new Guidance provision with recommendations for mounting a diamond-shaped warning sign where lateral space is constrained. FHWA also proposes a new Option to allow a vertically oriented rectangle for the legend of the warning sign when the methods contained in the Guidance are impractical. Further, FHWA proposes to add a new Standard prohibiting other modifications to sign shapes, such as cutting off the left and right points of a diamond, resulting in a vertical hexagon. FHWA proposes these changes to ensure consistency and recognition of sign shapes and to clarify that “modifying” a sign to fit into constrained locations cannot result in a new, non-standard shape.

33. In Section 2A.07 (existing 2A.11) “Dimensions,” FHWA proposes to add a Standard to prohibit the use of larger sign sizes where a maximum allowable sign size is prescribed. FHWA proposes this to provide consistency in sign dimensions.

FHWA also proposes to revise existing Guidance P8 to allow for specific exceptions to the increase in size of supplemental plaques for larger signs. FHWA proposes this change because some plaques are not allowed to be enlarged beyond the size specified.

34. In Section 2A.08 (existing Section 2A.13) Word Messages, FHWA proposes to add a new Standard requiring all word messages to be aligned horizontally across a sign, reading left to right, except as provided otherwise in the Manual. FHWA proposes this change to allow for signs that require a vertically oriented message, such as Reference Location signs and the Depth Gauge sign, and to make explicit that words are prohibited on retroreflective sign post strips for enhanced conspicuity. Though this requirement has always been inherent in the designs of the standardized signs in the MUTCD, the proposed statement clarifies the intent.

FHWA also proposes to add a Standard statement that requires distances displayed on signs to be in a fraction format, not decimal, except as provided otherwise in the Manual. FHWA proposes this change to be consistent with language found in other Chapters and standardized signs throughout the Manual.

35. In Section 2A.09 (existing Section 2A.12) Symbols, FHWA proposes to clarify the Guidance statement to indicate that new standardized warning or regulatory symbol signs should be

accompanied by an educational plaque where engineering judgment determines that the plaque would improve road user comprehension during the transition from word message to symbol signs.

FHWA also proposes to change the existing Option regarding the use of mirror images of symbols from a Guidance to an Option to allow the use of mirror images, rather than recommend their use, thereby allowing more flexibility.

Finally, FHWA proposes to eliminate the Option to use recreational and cultural interest area guide sign symbols on streets or highways outside of a recreational and cultural interest area. FHWA proposes this change for consistency with other proposed changes in Chapter 2M.

36. In section 2A.10 (existing Section 2A.14) Sign Borders, FHWA proposes to revise the Standard by incorporating language from existing Section 2E.16 requiring the border of a sign be the same color as the legend to outline the shape and ease recognition.

FHWA proposes this change to account for the proposed elimination of the Standard in Section 2E.16 and provide more specific justification for the Standard, and because this provision applies to all signs in general.

FHWA proposes to revise the Guidance to recommend that, on unusually large signs with oversized letter heights and other legend elements, the border width be 2½ inches wide and not exceed 3 inches in width.

FHWA also proposes to add a Support statement that provides reference to Section 2A.20 (existing Section 2A.07) regarding the use of LED units within the border of a sign.

37. In Section 2A.11 (existing Section 2A.15) Enhanced Conspicuity for Standard Signs, FHWA proposes to revise Option P1 to add a maximum period of 6 months for the NEW plaque to be displayed, adding DO NOT ENTER and WRONG WAY signs to the signs that are not allowed to be supplemented by a warning beacon, and allow a rectangular rapid-flashing beacon (RRFB) to supplement a Pedestrian or School warning sign at an uncontrolled, midblock crosswalk. FHWA proposes these changes based on common practice and the proposed addition of the RRFB to the Manual (proposed Chapter 4L).

FHWA proposes to delete the existing Standard prohibiting the use of the NEW plaque alone, because plaques by definition may not be used alone. As a result, this text is unnecessary.

FHWA also proposes to revise the Standard to clarify that the display of

any legend or other information on the retroreflective strip on a sign support is prohibited. FHWA adds this Standard because some agencies have added vertically arranged supplemental legends in substandard letter sizes on retroreflective strips. The existing Option allowing retroreflective strips does not allow for supplemental legends. FHWA adds this language to clarify the existing provisions.

FHWA also proposes to add a Standard statement that prohibits the installation of duplicate signs on the same post facing the same direction of traffic. The allowable methods of enhancing conspicuity do not currently allow this practice, and FHWA proposes this addition to clarify that current practices of this type are not appropriate means for enhancing conspicuity.

38. In Section 2A.12 (existing Section 2A.16) Standardization of Location, FHWA proposes to add a new Figure 2A-5 to illustrate the relative locations of Regulatory, Warning, and Guide Signs on an urban signalized intersection approach to help clarify typical signing at these complex situations for practitioners.

FHWA proposes to change the second sentence of the existing Standard to a Guidance, because the use of the posted or 85th-percentile speed for determining the appropriate sign spacing is just one factor, and there may be other factors that are more appropriate. Changing this to a Guidance statement provides agencies with more flexibility to use the factors they determine, through engineering judgment or study, to be most appropriate.

FHWA also proposes to add a Guidance provision to recommend that where certain signs indicate an action by a road user in the left lane or at the left-hand side of a one-way road, such as Merge signs, the sign should be located on the left-hand side of the roadway. In the case of a divided road, the sign should be located in the median if adequate width is available.

FHWA also proposes revising the existing Guidance to recommend that at locations where there are conflicts between the installation of regulatory and warning signs and a guide sign, that the guide sign should be relocated to another appropriate location where it would still be effective. FHWA also proposes the recommendation that in other cases, such as at a decision point, the guide sign should take precedence over other signs whose locations are not as critical to an immediate decision or action necessary by the road user. In all cases, careful attention should be given to minimizing sign clutter. FHWA proposes this additional information to

reinforce the importance of separating critical regulatory and warning information from guidance information so that road users are not overloaded with important information all at one location.

39. In Section 2A.14 (existing Section 2A.18) Mounting Height, FHWA proposes to add a new Standard stating that minimum mounting heights prescribed in this Section shall not supersede those necessary for crash performance of sign installations that are required to be crashworthy. FHWA proposes this change to remind users of the importance of crash performance of sign installations that are required to be crashworthy, as stated in existing provisions of the Manual.

40. In Section 2A.15 (existing Section 2A.19) Lateral Offset, FHWA proposes to relocate existing P7 to Section 2A.17 (existing Section 2A.21) because the Option statement permitting the use of existing supports is more appropriate in the Posts and Mountings section. In concert with this change, FHWA proposes to delete P8 because the Standard is unrelated to the lateral offset of the sign installation and serves no purpose since the location is prescribed under other provisions in the Manual.

41. In Section 2A.17 (existing Section 2A.21) Posts and Mountings, FHWA proposes to add the Option statement relocated from Section 2A.15 (existing Section 2A.19) permitting the use of existing supports. As part of this change, FHWA proposes to add a Support statement referring readers to lateral and height placement criteria for Guidance and Standards contained in this Manual for such signs.

FHWA also proposes to delete the Option paragraph regarding adding retroreflective strips to sign posts because it is redundant to Section 2A.11 (existing Section 2A.15). In concert with this change, FHWA proposes to retain a reference and relocate the Standard paragraph to Section 2A.11 (existing Section 2A.15).

FHWA also proposes to add a Standard with requirements regarding the placement of equipment for powering electronic components of a sign, including solar panels, when such equipment is mounted to a sign support. FHWA proposes these requirements to retain crashworthiness performance of the sign installation as well as to avoid obscuring the face or shape of the sign.

42. FHWA proposes to relocate and renumber existing Section 2A.04 Excessive Use of Signs, to Section 2A.19. FHWA proposes clarifications in P1 recommending signs should be used and located judiciously, minimizing

their proliferation in order to maintain their effectiveness; that signs should be used conservatively; and that sign clutter be avoided. FHWA also proposes to modify the second sentence to specify that route signs and directional guide signs for primary routes and destinations should be used frequently at strategic locations because their use promotes efficient operations by keeping road users informed of their location.

In concert with this change, FHWA proposes a new Support statement describing sign clutter consistent with Official Ruling No. 2-669(I)¹² as well as information regarding vanity signs, which are signs that are requested by an interested party, but are not essential for, or have no relation to, traffic control. As part of these changes, FHWA also proposes new Guidance statements recommending that signs and other traffic control devices be installed and maintained from a systematic standpoint rather than individually. FHWA proposes these changes because of the increased proliferation of signs, often installed separately over time, which reduces the effectiveness of signs and distracts road users at decision points and other locations requiring heightened attention.

43. In Section 2A.20 (existing Section 2A.07), retitled, "Retroreflection and Illumination," FHWA proposes to add a new Standard that requires the use of an opaque or non-retroreflective material for a black legend or background. Under headlamp illumination, retroreflective black appears as white, which creates a conflict with the existing requirement for signs to appear similar under daytime and nighttime conditions. FHWA proposes this addition to resolve this conflict.

FHWA also proposes to add two Support statements regarding the use of LED units. In concert with these additions, FHWA also proposes to revise existing Standards P7 through P10 and add two new Standards regarding the pitch and placement along the edge of a sign to incorporate additional provisions for LED units to ensure that adequate legibility would be maintained.

44. In Section 2A.21 (existing Section 2A.08) Maintaining Minimum Retroreflectivity, FHWA proposes to add to Guidance recommendations for the visual inspection and revised assessment or management methods that should be used to maintain sign

¹² FHWA's Official Ruling No. 2-669(I), dated November 20, 2009, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/2_669.htm.

retroreflectivity at or above the minimum levels in Table 2A–5 (existing Table 2A–3) and that signs that are below the minimum levels should be replaced. In addition, FHWA proposes to add paragraph headings to define which methods are management methods and which are assessment methods, and to include the three procedures that make up the visual assessment method. FHWA proposes these additions to clarify the types of methods and to place information that is currently available in other resources in one location.

45. In Section 2A.22 (existing Section 2A.23), retitled, “Median Opening Treatments for Divided Highways,” FHWA proposes to delete the existing Guidance and add new recommendations for signing a divided highway crossing as separate intersections when specific conditions are present. FHWA also proposes to add a new Figure 2A–6 to illustrate the new recommendations. FHWA proposes these changes to provide additional details for road user safety, based on the results of recently completed research on this topic.¹³

Discussion of Proposed Amendments to Chapter 2B Regulatory Signs, Barricades, and Gates

46. As part of the reorganization to improve usability of the MUTCD, FHWA proposes to include subchapter headings in Chapter 2B to organize sections into related groupings. FHWA proposes the following subchapters in Chapter 2B: General; Signing for Right-of-Way at Intersections; Speed Limit Signs and Plaques; Movement and Lane Control Signs; Passing Keep Right and Slow Traffic Signs; Selective Exclusion Signs; Do Not Enter, Wrong Way; One-Way and Related Signs and Plaques; Parking, Standing, Stopping, and Emergency Signs; Pedestrian Signs; Traffic Signal Signs; Road Closed and Weight Limit Signs; Other Regulatory Signs, and Barricades and Gates.

47. In Section 2B.01 Application of Regulatory Signs, FHWA proposes to delete portions of existing Standard P3 and all of P4 requiring signs to be the same shape and similar color by day and by night and restricting street lighting use for sign illumination, because the information is repetitive and covered elsewhere in the Manual.

48. In Section 2B.02 Design of Regulatory Signs, FHWA proposes to delete existing Option P2 and P3

because they are already covered in existing Section 2A.06.

FHWA also proposes to revise P5 from Guidance to Standard. FHWA also proposes to apply the Standard to LED signs for a part-time message and indicate the color scheme of regulatory messages displayed with LEDs. In concert with this change, FHWA also proposes adding an Option and two Standard paragraphs pertaining to the use of LEDs in the border of a sign and the display of regulatory signs in a full matrix changeable message sign, respectively. FHWA proposes these changes to provide uniformity in the application LEDs in traffic control signs and changeable message signs. These changes are necessary to ensure a consistent appearance in the sign legend regardless of the type of display, whether static, illuminated, or changeable.

49. In Section 2B.03 Size of Regulatory Signs, FHWA proposes to add a Standard statement regarding the size of regulatory signs on low-volume roads with operating speeds of 30 mph or less, to capture the language provided in the existing Part 5 text that has been redistributed among the remaining parts. FHWA also proposes to delete P6, requiring the use of 36” x 36” STOP signs on multi-lane approaches, because that requirement already exists in existing P3 and Table 2B–1. FHWA also proposes to delete P7 and P8 requiring the use of 36” x 36” STOP signs on side roads that intersect with multi-lane streets of 45 mph or higher speed limits, even if the side road is not multi-lane, because this may place an undue burden on agencies to change existing 30”x 30” signs at such locations.

FHWA proposes to revise existing Guidance P9 and add a new Guidance paragraph to allow the use of single lane or multi-lane conventional road sign sizes on ramps that connect expressways or freeways to intersections with a conventional roadway. FHWA proposes this change, because the operating characteristics of exit ramps connecting expressways or freeways to other expressways or freeways are different from those connecting expressways or freeways to conventional roads. As a result, signs on exit ramps connecting to conventional roads do not require the larger size signs associated with a freeway or an expressway.

Finally, FHWA proposes to add a Standard requiring the use of a near side NO TURN ON RED or RIGHT (LEFT) ON RED ARROW AFTER STOP sign, as applicable, to supplement a far side, single-lane sized R10–11, R10–11a, R10–11b, or R10–17a sign when the

distance between the stop line and the far side sign is more than 120 feet. FHWA proposes this to provide additional signing for turning vehicles at the near side of the intersection to supplement the far side sign at an increased distance.

50. FHWA proposes to delete existing Sections 2B.04 (Right-of-Way at Intersections), 2B.06 (STOP Sign Applications), 2B.07 (Multi-Way Stop Applications), and 2B.09 (YIELD Sign Applications) and replace them with new Sections 2B.06 through 2B.18, as described below, to address comprehensively the need for warrants for no control, yield control, stop control, or all-way stop control. FHWA proposes these changes to incorporate the results of a NCHRP Project 03–109,¹⁴ which proposed general considerations, alternatives to changing right-of-way control, and forms of unsignalized control from least restrictive to most restrictive, beginning with no control and concluding with all-way stop control.

51. In Section 2B.04 (existing Section 2B.05) STOP Sign (R1–1) and ALL-WAY Plaque (R1–3P), FHWA proposes to delete P5 regarding the use of the ALL-WAY Plaque because it is redundant with the preceding paragraph.

52. FHWA proposes to add a new section numbered and titled, “Section 2B.06 General Considerations,” incorporating some paragraphs from existing Section 2B.04 and proposed new general Support and Guidance paragraphs regarding signing for right-of-way at intersections. FHWA proposes adding the Support regarding the types of right-of-way control that can exist at an unsignalized intersection based on the research results of NCHRP Project 03–109.¹⁵ FHWA proposes adding Item G, suggesting the presence of a grade crossing near an intersection as a factor to consider when selecting a form of traffic control. FHWA proposes this additional item to address the potential for resultant queues at an intersection that may extend toward a nearby grade crossing.

53. FHWA proposes to add a new section numbered and titled, “Section 2B.07 Determining the Minor Road for Unsignalized Intersections,” that includes one Guidance paragraph from existing Section 2B.04 and one additional Guidance regarding criteria for selecting the minor road to be

¹³ “Traffic Control Devices and Measures for Deterring Wrong-Way Movements” NCHRP 881, 2018, can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/178000.aspx>.

¹⁴ Potential MUTCD Criteria for Selecting the Type of Control for Unsignalized Intersections, <http://www.trb.org/Main/Blurbs/172596.aspx>.

¹⁵ Potential MUTCD Criteria for Selecting the Type of Control for Unsignalized Intersections, <http://www.trb.org/Main/Blurbs/172596.aspx>.

controlled by YIELD or STOP signs. FHWA proposes these criteria based on the result of NCHRP Project 03–109.¹⁶

54. FHWA proposes to add a new section numbered and titled, “Section 2B.08 Right-of-Way Intersection Control Considerations,” with proposed new Guidance paragraphs regarding the alternative treatments to consider prior to converting to a more restrictive right-of-way control.

55. FHWA proposes to add a new section numbered and titled, “Section 2B.09 No Intersection Control,” consisting of new Guidance and Option statements regarding factors to consider when making a decision not to use intersection control. FHWA proposes this new section specifically to include information in the MUTCD regarding conditions for consideration when determining the need for intersection control.

56. FHWA proposes to add a new section numbered and titled, “Section 2B.10 Yield Control,” consisting of some text relocated from existing Sections 2B.06 and 2B.09, plus new Guidance paragraphs regarding the use of YIELD signs to control an intersection. FHWA proposes this change to combine information regarding yield control in one location.

57. FHWA proposes to add a new section numbered and titled, “Section 2B.11 Minor Road Stop Control,” consisting of one paragraph relocated from existing Section 2B.06, plus proposed new Guidance paragraphs regarding stop control on the minor road approach only. FHWA proposes this new section to provide information specific to the use of stop control on a minor approach.

58. FHWA proposes to add new section numbered and titled, “Section 2B.12 All-Way Stop Control,” consisting of one paragraph relocated from existing Section 2B.07 and proposed new Guidance and Standard paragraphs regarding warrants for all-way stop control. FHWA proposes this new section to clarify the application of all-way stop control and provide an introduction to the proposed new sections (Sections 2B.13 through 2B.17) related to all-way stop control warrants.

59. FHWA proposes to add a new section numbered and titled, “Section 2B.13 All-Way Stop Control Warrant A: Crash Experience,” consisting of one proposed new Option paragraph regarding the selection considerations for all-way stop control based on crash experience.

60. FHWA proposes to add a new section numbered and titled, “Section

2B.14 All-Way Stop Control Warrant B: Sight Distance,” consisting of a portion of one Support paragraph relocated from existing Section 2B.07, plus a proposed new Option paragraph regarding the selection considerations for all-way stop control based on sight distance.

61. FHWA proposes to add a new section numbered and titled, “Section 2B.15 All-Way Stop Control Warrant C: Transition to Signal Control or YIELD Control at a Roundabout,” consisting of one proposed Option paragraph regarding the selection considerations for all-way stop control based on a transition plan to convert an intersection to signal control.

62. FHWA proposes to add a new section numbered and titled, “Section 2B.16 All-Way Stop Control Warrant D: 8-Hour Volume (Vehicle, Pedestrians, Bicycles),” consisting of one proposed new Option paragraph regarding the selection considerations for all-way stop control based on the criteria included in Table 2B–2.

63. FHWA proposes to add a new section numbered and titled, “Section 2B.17 All-Way Stop Control Warrant E: Other Factors,” consisting of portions of an existing Option paragraph relocated from existing Section 2B.07, plus one proposed new Option paragraph regarding the selection considerations for all-way stop control based on other factors.

64. In Section 2B.18 (existing Section 2B.10) STOP Sign or YIELD Sign Placement, FHWA proposes to remove existing Standard P4 through P6 restricting the use of inventory stickers and other items on STOP and YIELD signs, because those restrictions apply to all signs, not just STOP and YIELD signs, and therefor and proposes to relocate this text to Chapter 2A.

FHWA proposes to add a Guidance limiting supplemental plaques used in conjunction with a STOP or YIELD sign to those specified in the MUTCD. FHWA proposes this change to ensure consistency in the use of supplemental plaques mounted beneath STOP and YIELD signs.

FHWA also proposes to add an Option allowing the use of a TO TRAFFIC IN CIRCLE (R1–2bP) or TO ALL LANES (R1–2cP) plaque, mounted below the YIELD sign, for locations where drivers must yield to traffic in a multi-lane roundabout. FHWA proposes this option to address situations that occur when drivers at a multi-lane roundabout are not anticipating the vehicle in the inside lane to maneuver to exit the roundabout.

65. In section 2B.19 (existing Section 2B.11) Yield Here to Pedestrians Signs and Stop Here for Pedestrians Signs

(R1–5 Series),” FHWA proposes to add a Support statement describing the intent of the R1–5 series signs, which is to mitigate scenarios associated with pedestrian and vehicle visibility.

FHWA proposes to revise the first sentence of Standard P1 to address confusion on the existing limitation of the R1–5 series signs that are only appropriate for use on multi-lane approaches where there is a multiple-threat scenario that can block other drivers’ and pedestrians’ views of one another. FHWA also proposes to change the last sentence of Standard P1 to correct an oversight in the 2009 Edition, prohibiting, rather than allowing, the use of the STATE LAW legend to be displayed at the top of these signs because the sign applies to the specific location for yielding or stopping in advance of a specific crosswalk that is occupied, rather than to the general requirement to yield or stop at occupied crosswalks.

In addition, FHWA proposes to change the advance placement distance portion of Guidance P2 to a Standard, requiring that the R1–5 series signs be placed 20 to 50 feet in advance of the nearest crosswalk line to ensure that they adequately mitigate the multiple-threat scenario on a multi-lane approach, which places pedestrians at risk when a second vehicle blocks other drivers’ view of pedestrians and the pedestrians’ view of the vehicles approaching in the adjacent lanes. FHWA proposes this change to ensure that the placement of the signs does not interfere with signs at the intersection and/or potentially cause misinterpretation as a Stop-controlled intersection either by approaching traffic or traffic on the cross street, as FHWA has observed in practice.

FHWA also proposes to add an Option for the R1–5a and R1–5c signs with the schoolchildren symbol in place of the pedestrian symbol, provided that the signs are only used in advance of a marked crosswalk that crosses an uncontrolled multi-lane approach within school zones. FHWA proposes this change to reflect Official Interpretation 2(09)–40(I),¹⁷ allowing the use of the schoolchildren symbol in the R1–5 series signs, similar to the R1–6 series In-Street Pedestrian Crossing signs when used at an unsignalized school crossing.

66. FHWA proposes to renumber and retitle existing Section 2B.12, “Section 2B.20 In-Street and Overhead Pedestrian

¹⁷ FHWA’s Official Ruling No. 2(09)–40(I), June 4, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/2_09_40.htm.

¹⁶ *Ibid.*

and Trail Crossing Signs (R1–6 and R1–9 Series)” to reflect the additional proposed Trail Crossing sign. FHWA also proposes to revise existing Standard P3 through P5 to include the proposed new Trail Crossing sign.

FHWA proposes to clarify in Standard P3 that no more than one in-street sign shall be placed in the roadway, on a lane line for a one-way roadway application, or on a median island. FHWA proposes this change to minimize sign proliferation in the roadway and to prevent potential distraction due to an overuse of signs at a single location. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement, in response to an apparent misinterpretation of the existing provisions as evidenced by a number of technical inquiries and observations of noncompliant field deployments.

FHWA proposes to change existing Option P7 to a Standard and add a new Standard to require that if used, the In-Street or Overhead Pedestrian or Trail Crossing sign shall be used as a supplement to a Pedestrian Crossing (W11–2) or Trail Crossing (W11–15) warning sign with a diagonal downward-pointing arrow (W16–7P) plaque at the crosswalk location. FHWA proposes this change to ensure that if an in-street or overhead sign is used, that the appropriate non-vehicular warning sign is in place to ensure uniformity in application at crosswalks. FHWA proposes this change as a conforming edit, which does not change the existing underlying requirement, in response to an apparent misinterpretation of the existing provisions as evidenced by a number of technical inquiries and observations of noncompliant field deployments.

FHWA proposes to add an Option allowing In-Street Pedestrian or Trail Crossing signs to be mounted back to back in the median or on the centerline of an undivided roadway. FHWA proposes this option to minimize the number of in-street obstructions at the crossing.

FHWA also proposes to clarify in Standard P8 that the In-Street Pedestrian or Trail Crossing sign and the Overhead Pedestrian Crossing or Trail sign shall not be used at crosswalks on approaches controlled by a traffic control signal, pedestrian hybrid beacon, or an emergency vehicle hybrid beacon. FHWA proposes this clarification to eliminate conflict between the sign that says STOP or YIELD and a green signal indication on a traffic control signal or hybrid beacon. In concert with this change, FHWA

proposes to add an Option statement permitting the use of the In-Street Pedestrian and Overhead Pedestrian and Trail Crossing sign at intersections or midblock pedestrian crossings with flashing beacons, because flashing beacons do not display a green indication, and therefore the use of this sign would not conflict with the signal indication.

Finally, FHWA proposes to reword existing Option P15 to clarify that both the in-street and overhead mountings of signs may be used together at the same crosswalk.

67. In Section 2B.21 (existing 2B.13) Speed Limit Sign (R2–1), FHWA proposes to reorganize and revise material based on the NTSB’s recommendation¹⁸ to review how speed limits are determined. FHWA proposes to move and revise Guidance P10, 12, and 13 and Option P16 to earlier in the section to clarify the factors that should be considered when establishing or reevaluating speed limits within speed zones. FHWA proposes changes to reinforce the stated understanding that other factors, in addition to the 85th-percentile speed, have a role in setting speed limits. FHWA retains reference to 85th-percentile speed as a factor that should be considered, particularly for freeways and expressways, as well as for rural highways, except those in urbanized locations within rural regions. FHWA also retains reference to the setting of speed zones in broad terms, thereby allowing agencies to establish detailed criteria based upon national guidance or based upon research, outside the MUTCD. In addition to providing comment on this proposed change, FHWA also requests comment on the following additional recommendations of the NTSB report: (1) Removal of the 85th-percentile speed as a consideration in setting speed limits regardless of the type of roadway (this recommendation was based in part on the assumption that that the 85th-percentile speed can increase over time as a result of the posted speed limit); and (2) the requirement to use an expert system to validate a speed limit that has been determined through engineering study. Commenters are 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.

¹⁸NTSB report “Reducing Speeding-Related Crashes Involving Passenger Vehicles,” can be viewed at the following internet website: <https://www.ntsb.gov/safety/safety-studies/Documents/SS1701.pdf>.

FHWA also proposes to add Support to this section directing users to FHWA’s Engineering Speed Limits web page, which provides information on where to find additional resources on the methods and practices for setting Speed Limits for specific segments of roads as well as tools to assist practitioners, such as USLIMITS2.

FHWA also proposes to change the second sentence of P4 from Standard to Guidance to recommend, rather than require, that additional Speed Limit signs be installed beyond major intersections and at other locations where it is necessary to remind road users of the applicable speed limit. FHWA proposes this change because engineering judgment is involved to determine what constitutes a major intersection.

FHWA also proposes to modify existing paragraph 9 to reference the Reduced Variable Speed Zone (W3–5b) and Truck Speed Zone (W3–5c) signs in conjunction with their addition to Chapter 2C. As part of this change, FHWA also proposes to add an Option for the use of an END VARIABLE SPEED LIMIT (R2–13) sign at the downstream end of a variable speed zone to provide notice to road users of the termination of the zone.

FHWA also proposes, in conjunction with the above, a Standard statement requiring an END TRUCK SPEED LIMIT (R2–14) sign be installed at the downstream end of the zone. This Standard is necessary to ensure that road users receive notice of the termination of a truck speed zone where trucks are allowed to resume the general regulatory speed limit.

In addition, FHWA proposes to revise existing P18 to replace the term “changeable message sign” with “variable speed limit sign” to reflect the sign type more accurately. FHWA also proposes to add a Standard statement requiring the variable speed limit sign legend “SPEED LIMIT” to be a black legend on a white retroreflective background, consistent with the standard legend and background on a Speed Limit sign. FHWA also proposes in this Standard statement to require the variable speed limit legend on a variable speed limit sign to be indicated by white LEDs on an opaque black background. FHWA proposes to add this Standard to clarify the text, as indicated in Official Ruling No. 2(09)–3(I).

Finally, FHWA proposes to delete existing Option P19 and Guidance P20 and add a Support statement referencing Section 2C.14 for provisions for the use of a Vehicle Speed Feedback sign, to group that information in Chapter 2C Warning signs.

68. FHWA proposes to renumber and retitle existing Section 2B.14 to “Section 2B.22 Vehicle Speed Limit Plaques (R2–2P Series)” to reflect proposed changes in the section to clarify that a legend similar to TRUCKS XX may be used for other vehicles on a speed limit plaque. FHWA proposes this change to provide agencies with more flexibility in speed limit signing for various vehicle types, and to streamline processes by making it easier for agencies to specify and fabricate such plaques by standardizing the more common legends.

69. FHWA proposes to retitle existing Section 2B.16 to “Section 2B.24 Minimum Speed Limit Plaque (R2–4P) and Combined Maximum and Minimum Speed Limits (R2–4a) Sign” to reflect both the plaque and sign that are currently discussed in the existing Section. In concert with this change, FHWA also proposes to add a sentence to the existing Standard to clarify that the R2–4P plaque, if used, must be installed below the R2–1 sign, which is a stated condition of the existing Option paragraph that immediately follows. FHWA proposes this change as a conforming edit, which would not change the existing underlying condition of the Option.

70. In Section 2B.25 (existing Section 2B.17) Higher Fines Signs and Plaque (R2–6P, R2–10, and R2–11), FHWA proposes to change the first sentence of existing Standard P1 to Guidance to reflect the recommendation, rather than the requirement, to use a BEGIN HIGHER FINES ZONE (R2–10) sign or a FINES HIGHER (R2–6P) plaque to provide notice to road users. This proposed change would give agencies more flexibility in determining whether to install such signs and plaques, particularly those States that have higher fines by statute in school zones, work zones, and other locations.

71. In Section 2B.26 (existing Section 2B.18) Movement Prohibition Signs (R3–1 through R3–4, R3–18, and R3–27), FHWA proposes to add a Guidance recommending the use of Movement Prohibition signs only to prohibit a turn or through movement from an entire approach and not to designate movements that are required or permitted from a specific lane or lanes on a multi-lane approach. FHWA proposes this additional language to prevent the use of multiple conflicting movement prohibition signs along an approach where lane use signs and pavement markings would be more appropriate.

FHWA proposes to revise the first item under Option P12 to replace the term “changeable message sign” with less specific language describing the

operation of the sign. In concert with this change, FHWA proposes to add a Standard statement regarding the use of blank-out LED signs and the allowable LED colors, to reflect current practice.

FHWA also proposes to add a new Option statement to allow the use of permanently mounted signs incorporating a supplementary legend showing the vehicle class restriction where the movement restriction applies to certain vehicle classes. FHWA proposes to add this language to provide agencies with flexibility in signing movement prohibitions for various vehicle classes without having to mount a plaque.

FHWA also proposes to add a Standard statement describing the design of the blank-out part-time electronic display for the Movement Prohibition sign. This Standard is necessary to ensure design consistency and uniformity in appearance with static signs used for the same purpose.

72. In Section 2B.27 (existing Section 2B.19) Intersection Lane Control Signs (R3–5 through R3–8), FHWA proposes to change Standard P6 to Guidance to reinforce that the use of an overhead intersection lane control sign on one lane of an approach does not require the use of overhead intersection lane control signs on the other lanes of that same approach, yet such signs can be used. In concert with this change, FHWA proposes a slight modification to Guidance P3 to clarify the independent use of signs. FHWA proposes this change to clarify the application of these signs and eliminate potential confusion with the use of the signs.

FHWA also proposes to remove Option P7 as the mounting requirements are specifically outlined in the specific Intersection Lane Control sections that follow.

73. In Section 2B.28 (existing Section 2B.20) Mandatory Movement Lane Control Signs (R3–5, R3–5a, R3–7, R3–19 Series, and R3–20), FHWA proposes to change the second sentence of Standard P1 to Guidance to provide flexibility as to where to place certain Mandatory Movement Lane Control signs.

In concert with this change, FHWA also proposes to revise existing Standard P3 to prohibit explicitly the R3–7 sign from being mounted at the far side of the intersection, incorporating the existing Standard P1 that requires these signs to be located in advance of the intersection. FHWA proposes this change to reinforce the existing requirement, which is intended to avoid confusion with the sign applying to a downstream intersection as has been demonstrated in practice. If a sign at the

far side of the intersection is determined to be needed, then the proposed revision to Standard P1 would allow for other signs to be mounted overhead and aligned with each lane adjacent to the signals. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement.

FHWA also proposes to delete the first phrase of Standard P4, which specifies the use of the Mandatory Movement Lane Control symbol signs when the number of lanes available to through traffic is three or more. FHWA proposes to remove this requirement to promote uniformity, since there is already an existing post-mounted version of the sign (R3–7). In concert with this change, FHWA proposes to delete existing Guidance P5 in this section.

FHWA proposes to add a Guidance statement recommending the use of the EXCEPT BUSES or EXCEPT BICYCLES plaque where the lane restriction does not apply to buses or bicycles.

FHWA also proposes to delete existing Option P9 regarding the back-to-back mounting of a Mandatory Movement Lane Control (R3–5) sign for a left-turn lane and Keep Right (R4–7) signs, because the Mandatory Movement Lane Control (R3–5) sign is for overhead mounting and therefore installing a Keep Right (R4–7) sign on the back is not appropriate.

FHWA proposes to add an Option allowing the use of proposed new post-mounted LANE FOR LEFT TURN ONLY and LANE FOR U AND LEFT TURNS ONLY (R3–19 series) signs on the median at the start of the taper to be used in situations where a left-turn lane is added at a median location. FHWA proposes these new signs to standardize the message for which a number of States use a variation.

FHWA proposes to revise Option P11 to indicate that the BEGIN RIGHT TURN LANE (R3–20R) and the BEGIN LEFT TURN LANE (R3–20L) signs may be used in situations where the turn lane may not be apparent. FHWA proposes this revision to clarify when it is appropriate to use the sign because other standard signs exist to indicate a mandatory turn lane.

FHWA proposes to add a new Guidance statement describing the recommended use of the DO NOT DRIVE ON SHOULDER (R4–17) sign at locations where the transition from a paved shoulder to a mandatory turn lane might not be apparent and traffic regularly enters the shoulder to access the turn lane. FHWA proposes this language to clarify the method to address this condition. Use of the

BEGIN RIGHT TURN LANE sign is not intended for these situations.

74. In Section 2B.29 (existing Section 2B.21) Optional Movement Lane Control Sign (R3-6 Series), FHWA proposes to change the 2nd sentence of Standard P1 to Guidance to provide flexibility as to where to place the Optional Movement Lane Control signs.

FHWA proposes to add a standard U- and Left-Turn symbol Optional Movement Lane Control sign R3-6a and a standard oblique multiple left symbol Optional Movement Lane Control sign R3-6b with specific reference in the Standard P1. FHWA proposes this change to provide for left-turn lanes from which a U-turn is allowed, such as at median left-turn lanes as well as where there are multiple left turn angled movements that can be made from the lane.

FHWA proposes to relocate and revise existing Standard P5 to incorporate the requirement that the Optional Movement Lane Control sign be mounted overhead in Standard P1. In concert with this change, FHWA proposes to delete existing Guidance P6, because Optional Movement Lane Control signs are mounted overhead, not post-mounted. The R3-8 Advance Intersection Lane Controls signs are post-mounted.

FHWA proposes to delete existing Option P7 because the arrows on the sign indicate permitted movements and the text "OK" is repetitive and not needed.

75. In Section 2B.31 (existing Section 2B.22) Advance Intersection Lane Control Signs (R3-8 Series), FHWA proposes to add TAXI, BUS, BIKE or bicycle symbol to the allowable word messages that may be used within the border in combination with arrow symbols on Advance Intersection Lane Control signs. FHWA proposes to remove OK and ALL from the optional word messages as the lane control arrows are indicating this movement as allowable.

In addition, FHWA proposes to add an Option statement allowing the R3-8 sign to be modified to show the bicycle lane with a white legend on a black background where bicycle lane is between two general purpose lanes. FHWA proposes these changes to provide additional options for alerting motor vehicles and bicyclists of appropriate lane usage in advance of an intersection.

FHWA also proposes to change existing Guidance P3 to clarify that the Advance Intersection Lane Control sign should be placed either along the lane tapers or at the beginning of the turn lane. FHWA proposes this change

because, if used in advance of the lane tapers, the sign and the available lanes would not match; therefore, the sign would not help a driver discern which lanes are added and could result in uncertainty due to its ambiguous message.

FHWA proposes a new Standard statement to prohibit mounting an Advance Intersection Lane Control sign at the far side of an intersection to which it applies. FHWA proposes this statement to reinforce placement in advance of the intersection either along the lane tapers or at the beginning of the turn lane. This Standard is necessary in order to avoid potential confusion with the sign applying to a downstream intersection.

FHWA proposes a new Standard statement requiring the R3-5bP and R3-5fP to be mounted above the R3-8 sign, when the R3-8 sign only shows the two outermost lanes of the roadway. FHWA adds this sign to display a complete message to the road user to comprehend the application when not all of the lanes are being shown on the R3-8 series sign.

76. FHWA proposes to renumber and retitle existing Section 2B.23 "Section 2B.31 Right (Left) Lane Must Exit Signs (R3-33, R3-33a)" to provide specific reference to and information regarding the use of the proposed new R3-33a sign, a vertical rectangle version of the R3-33 sign for use in limited right-of-way situations.

77. In Section 2B.33 (existing Section 2B.25) BEGIN and END Plaques (R3-9cP, R3-9dP), FHWA proposes to delete the Standard statement, and instead proposes to incorporate the proper placement of the plaque into the Option statement, because placement of the plaque does not warrant a Standard statement.

78. In Section 2B.34 (existing Section 2B.26) Reversible Lane Control Signs (R3-9e through R3-9i), FHWA proposes to add an Option statement indicating that where longitudinal barriers separate opposing directions of traffic, the R3-9g or R3-9h signs may be omitted.

FHWA also proposes to add a Guidance statement to provide for consistency between parking signs and reversible lane signs where curb parking is allowed. FHWA proposes this to avoid confusion.

79. In section 2B.38 KEEP RIGHT EXCEPT TO PASS Sign (R4-16) and SLOWER TRAFFIC KEEP RIGHT Sign (R4-3), FHWA proposes to make revisions to Option P1 and Guidance P2 to clarify that the KEEP RIGHT EXCEPT TO PASS sign is to be used where there are two lanes in one direction of travel. As currently written, "multi-lane" implies that no matter how many lanes

are present, all traffic should be in the right lane. The meaning of this sign is to indicate that the left lane is for passing only; therefore, the message on the sign is only appropriate for roadways with two-lanes in the same direction of travel.

80. In Section 2B.40 (existing Section 2B.32), retitled, "Keep Right and Keep Left Signs (R4-7 Series, R4-8 Series)," FHWA proposes to add a new Guidance statement recommending the word legend (R4-7a, R4-7b, R4-8a, or R4-8b) signs should be used instead of the symbol (R4-7 or R4-8) signs to emphasize the degree of curvature away from the approach direction where the approach end of the island channelizes traffic away from the approach direction, such as on a loop ramp, to define the intended uses of signs that have similar legends better.

FHWA also proposes additional Option, Support, and Standard statements regarding the use of the Keep Right sign on medians on divided highways, as the result of recent research,¹⁹ to provide more clarity regarding the proper use and placement of these signs.

81. FHWA proposes to add a new section numbered and titled, "2B.45 ALL TRAFFIC Sign (R4-20) and RIGHT (LEFT) TURN ONLY Sign (R4-21)" to include new Options, Guidance, and Standards regarding the use of the subject signs. FHWA proposes to add this section to allow for additional signs at intersections where movement prohibition and One-Way signs do not adequately convey the allowable direction of travel.

82. In Section 2B.46 (existing Section 2B.39) Selective Exclusion Signs, FHWA proposes to add provisions for a new No Snowmobiles Symbol sign (R9-15) that may be used where snowmobiles are prohibited on roadways or shared-use paths. FHWA proposes this new symbol sign based on research indicating that this symbol has high recognition value.²⁰ FHWA also proposes to include provisions for the NO THRU TRAFFIC, NO THRU TRUCKS, AND EXCEPT LOCAL DELIVERIES plaque as typical exclusion messages to reflect common practice.

FHWA also proposes to add a reference to R5-10, which would replace the current R5-10a sign. FHWA

¹⁹NCHRP Report 881 "Traffic Control Devices and Measures for Detering Wrong-Way Movements," can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/178000.aspx>.

²⁰"Synthesis of Non-MUTCD Traffic Signs", FHWA, December 2005, p. 19, can be viewed at the following internet website: https://rosap.nhtl.bts.gov/view/dot/34772/dot_34772_DS1.pdf.

proposes to revise the R5–10a to include the legend “ON FREEWAY” below the primary legend.

Finally, FHWA proposes to eliminate the word legend version of the NO TRUCKS (R5–2a) as an alternate to the No Trucks (R5–2) symbol sign. FHWA proposes this change for consistency with word message signs where a symbol sign exists.

83. In the proposed Sub-Chapter DO NOT ENTER, WRONG WAY, AND ONE-WAY Signs and Related Signs and Plaques, FHWA proposes to reorganize the sections so signs associated with wrong-way movements are consecutive sections rather intermixed with Selective Exclusion signs. In concert with these changes, FHWA proposes to provide clarifications and correct inconsistencies between the text and figures related to wrong-way movement signing, as the result of recent research.²¹

84. In Section 2B.47 (existing 2B.37), “DO NOT ENTER Sign (R5–1),” FHWA proposes, as the result of recent research,²² to clarify Standard P1 to require DO NOT ENTER signing where a two-way roadway becomes a one-way roadway and near the downstream end of an interchange exit ramp. FHWA proposes to add a Standard paragraph requiring a DO NOT ENTER (R5–1) sign be installed at an intersection with a divided highway where the crossing functions as two separate intersections, except on low speed urban streets. In concert with this change, FHWA proposes to add Option statements allowing the use of DO NOT ENTER signs at an intersection with a divided highway where crossing functions as a single intersection, as well as allowing the omission of DO NOT ENTER signs at an intersection with a low speed urban street that is a divided highway at a crossing that functions as two separate intersections. As part of these changes, FHWA proposes to recommend that if used at an intersection with a divided highway that functions as a single intersection, DO NOT ENTER signs should be placed on the outside edge of the roadway facing traffic that might enter the roadway in the wrong direction. Finally, FHWA proposes to delete existing Option P4, since it is incorporated in the proposed new language in this section.

FHWA also proposes to add an Option statement regarding the use of white or red LEDs within the border of

the DO NOT ENTER sign to enhance the conspicuity of the sign.

85. In Section 2B.48 (existing Section 2B.38) WRONG WAY Sign (R5–1a), FHWA proposes to add a Guidance statement recommending the WRONG WAY sign be placed on the same side of the road as the DO NOT ENTER sign. FHWA proposes this language, as the result of recent research,²³ to provide additional notification to road users that they are not to enter the roadway and clarify the placement of the WRONG WAY sign as it supplements the DO NOT ENTER sign.

FHWA proposes to add an Option statement allowing the use of white or red LEDs within the border to enhance the conspicuity of the sign.

86. In section 2B.49 (existing 2B.41) Wrong-Way Traffic Control at Interchange Ramps, FHWA proposes to add items F (Lane control or movement prohibition signs) and G (Keep Right signs) as traffic control devices that may be used to supplement the signs and pavement markings at interchange exit ramp terminals where the ramp intersects a crossroad in such a manner that wrong-way entry could inadvertently be made. FHWA proposes this new language, as the result of recent research, to provide additional tools for agencies to use to prevent vehicles from entering interchange exit ramps in the wrong direction.

FHWA proposes to add a new Option statement for the use of a NO LEFT TURN (R3–2) sign on the left side of interchange entrance ramps where the ramp merges with the through roadway and the design of the interchange does not clearly make evident the direction of traffic. This text supports the sign shown in existing Figure 2B–19. FHWA also proposes that a supplemental R3–2 sign may be located on the right side of the entrance ramp at the gore if one is installed on the left to provide agencies with greater flexibilities in signing for wrong-way traffic control.

FHWA also proposes a new Option statement and accompanying figure for the use of a ONE WAY sign and/or a NO TURNS (R3–3) sign on interchange entrance ramps where the ramp merges with the through roadway and the design clearly indicates the direction of flow, to provide agencies with greater flexibilities in signing for wrong-way traffic control.

FHWA proposes to delete Option P5 referencing special needs or prohibitive information. FHWA proposes this

change because the statement is nonspecific and Chapter 2A already contains language specifying that a decision to use a particular device at a particular location should be made on the basis of either an engineering study or the application of engineering judgment.

In addition, FHWA revises Option P6 to clarify that the low mounting height for an independent installation of a DO NOT ENTER or WRONG WAY sign is for locations along the exit ramp rather than at the intersection with the crossroad. FHWA also proposes an Option to allow the installation of a low-mounted WRONG WAY sign on the DO NOT ENTER assembly at the intersection with the crossroad, provided that the DO NOT ENTER sign is mounted at a height consistent with the requirements for signs in general. FHWA proposes this change to ensure that the basic signing is at the typical mounting height a road user would expect to see, while still allowing signs at a lower mounting height as a supplement that are intended for a potentially disoriented driver whose vision might be focused at a lower height.

87. In Section 2B.50 (existing Section 2B.40) ONE WAY Signs (R6–1, R6–2), FHWA proposes, as the result of recent research,²⁴ to replace all language describing an intersection with a divided highway that has a median width at the intersection itself of 30 feet with proposed new language that describes the crossing of a roadway with a divided highway as an intersection operating as single or separate intersections. FHWA proposes these changes because it is important to base the application of ONE WAY signing on how the intersection functions, rather than the width of the median.

FHWA also proposes to revise Option P11 to indicate that a One-Direction Large Arrow sign may be used instead of or in addition to a ONE WAY sign in the central island of a circular intersection. FHWA proposes this change to reflect the proposed removal of the Roundabout Directional Arrow from the MUTCD.

In addition, FHWA proposes to add a Standard statement specifying that when a One-Direction Large Arrow sign is used without a ONE WAY sign, the R6–5P plaque shall be mounted below the Yield sign on the approach to a roundabout. FHWA proposes this to ensure that when only the One-

²¹ NCHRP Report 881 “Traffic Control Devices and Measures for Deterring Wrong-Way Movements,” can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/178000.aspx>.

²² *Ibid.*

²³ NCHRP Report 881 “Traffic Control Devices and Measures for Deterring Wrong-Way Movements,” can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/178000.aspx>.

²⁴ NCHRP Report 881 “Traffic Control Devices and Measures for Deterring Wrong-Way Movements,” can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/178000.aspx>.

Direction Large Arrow is used that a regulatory message indicating the direction of movements is provided.

FHWA also proposes to delete P10 and 13 because they are duplicative and contradictory, respectively, and therefore not necessary to include in the MUTCD.

88. In Section 2B.51 (existing 2B.42) Divided Highway Crossing Signs (R6–3, R6–3a), FHWA proposes similar changes as the result of recent research,²⁵ as described in proposed Section 2A.22, to the text regarding the description of a divided highway at a crossing that functions as separate intersection(s), rather than referring to the median width at the intersection.

89. FHWA proposes to relocate and renumber existing Section 2B.44 as “Section 2B.52 Roundabout Circulation Plaque (R6–5P).”

90. FHWA proposes to delete existing Section 2B.43 Roundabout Directional Arrow Signs, because the design of the R6–4 series signs, for which there are 3 versions, confounds a warning sign with a regulation and, as a result, have become prone to misuse. To address the condition for which these signs were intended, this proposed change also includes associated changes to the use of ONE WAY signs and the Large Arrow sign, as described above.

91. As discussed above, FHWA proposes to relocate and renumber existing Section 2B.44 as “Section 2B.51 Roundabout Circulation Plaque (R6–5P).”

92. FHWA proposes to delete existing Section 2B.45 Examples of Roundabout Signing. Roundabouts have become very common. The figures have been retained in Chapter 2B; however, a separate section dedicated to examples is not needed.

93. In Section 2B.53 (existing Section 2B.46) Parking, Standing, and Stopping Signs (R7 and R8 Series), FHWA proposes to expand the Support statement to categorize parking signs into two categories: Prohibited parking and permitted parking with restrictions and provide examples of each category.

94. In Section 2B.54 (existing Section 2B.47) Design of Parking, Standing, and Stopping Signs, FHWA proposes to revise Standard paragraphs 2–4 to incorporate the proposed prohibitive and permissive parking sign classifications and provide additional information on the design of such signs in order to maintain consistency in general sign design, while also allowing

flexibility for agencies to modify legends for specific regulations.

To improve consistency in the information provided in parking signs, FHWA proposes to expand the list of parking information that should be displayed on signs existing in Guidance P5 to include qualifying or supplementary information, exemptions to the restriction of prohibition, and tow-away message or symbol.

FHWA proposes to add a Standard requiring the times and days for which parking regulations are in effect to be displayed on the signs if they are not in effect all times of day or all days of the week. FHWA proposes this to ensure consistent signing methods in order to improve clarity for drivers wanting to park.

FHWA proposes to modify Option P18 regarding the use of word message plaques with the R8–3 series signs. FHWA proposes to remove the EXCEPT SUNDAYS AND HOLIDAYS (R8–3bP), LOADING ZONE (R8–3gP), and X:XX A.M to X:XX P.M.(R8–3hP) plaques as these are generally in urban conditions and are already covered by the R7 series parking signs. FHWA proposes to modify the ON PAVEMENT (R8–3cP), ON BRIDGE (R8–3dP), ON TRACKS (R8–3eP), and EXCEPT ON SHOULDERS (R8–3fP) by removing the plaque designations and combining the word legends with the standard NO PARKING symbol (R8–3) sign.

FHWA proposes to change the legend of the Emergency Snow Route (R7–203) sign to “Snow Emergency Route” to be consistent with the prevailing current practice and the fact that the restrictions apply during a declared snow emergency.

FHWA proposes several changes in this section to incorporate electronic payment, change the term “pay parking” to “metered parking” and other editorial changes to reflect current practice and commonly used nomenclature. This includes a proposed Option statement to accompany a proposed new Mobile Parking Payment plaque that may be installed below a Metered Parking sign.

FHWA also proposes to add an Option statement to allow the display of maximum time limits that vary by time of day or day of the week on the R7–20 sign to be omitted and instead displayed on the multi-space parking meter so that they are visible to pedestrians as they make payments.

FHWA also proposes to add a Standard statement immediately preceding existing Standard P8, to reiterate the existing requirement that the Accessible Parking (R7–8) sign display only the official International

Symbol of Accessibility and not a modification thereof. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement in Chapter 2A.

FHWA proposes a new Guidance statement to incorporate provisions for Electronic Vehicle parking. The proposed language is based on FHWA’s Memorandum on Regulatory Signs for Electric Vehicle Charging and Parking Facilities.²⁶

FHWA proposes to delete the second and third sentences of existing Option P14 regarding the color of the bus symbol and the use of transit logos on the R7–107 sign, or alternates, because the text is not necessary and the use of transit logos on a sign may not be practical. In concert with this change, FHWA also proposes to delete the existing R7–7 sign, because the R7–107, as well as the R7–107a sign, are more distinguishable, and there is no need for an additional sign.

FHWA proposes to delete P19 and 20 regarding color coding of parking time limits. FHWA proposes this change to streamline the design of parking signs and because the standard colors of the parking signs have specific meanings as prescribed by the manual. In addition, the time limits are adequately displayed by the numbers on the signs.

Finally, FHWA proposes new Guidance paragraphs at the end of the section regarding the use of legends other than those on standard parking signs and the letter height of the principal legend. FHWA proposes these new paragraphs to provide agencies flexibility in creating specific signs while maintaining uniformity in design provisions.

95. In Section 2B.55 (existing Section 2B.48) Placement of Parking, Stopping, and Standing Signs, FHWA proposes to add a Guidance statement recommending signs placed at the head of perpendicular parking stalls to be parallel to the roadway facing the parking stall. FHWA proposes this addition to promote uniformity and clarity in signing parking stalls.

FHWA proposes to change P4 from a Standard to a Guidance to recommend, rather than require mounting parking signs back to back at the transition point between two parking zones, to provide jurisdictions with flexibility when it might be impractical to mount signs back-to-back.

FHWA also proposes to relocate and revise the Option statement regarding

²⁵ NCHRP Report 881 “Traffic Control Devices and Measures for Detering Wrong-Way Movements,” can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/178000.aspx>.

²⁶ FHWA’s Memorandum on Regulatory Signs for Electric Vehicle Charging and Parking Facilities can be accessed at the following web address: <https://mutcd.fhwa.dot.gov/resources/policy/rsevcpfmemo/>.

the use of signs to display blanket regulations from existing Section 2B.47 to this section, because this section deals specifically with sign placement.

96. In Section 2B.56 (existing Section 2B.49) Emergency Restriction Signs (R8-4, R8-7, R8-8), FHWA proposes to move existing Standard P3 to the beginning of the section and delete the color red as a legend color, for consistency with non-standard legends, as only black legends are allowed on Emergency Restriction signs.

97. In Section 2B.57 (existing Section 2B.50), "WALK ON LEFT FACING TRAFFIC and No Hitchhiking Signs (R9-1, R9-4, R9-4a)," FHWA proposes to change Standard P2 to Guidance to allow agencies greater flexibility in the installation of the signs.

98. In Section 2B.59 (existing Section 2B.52) Traffic Signal Pedestrian and Bicycle Actuation Signs (R10-1 through R10-4, and R10-24 through R10-26), FHWA proposes to revise Standard P1 to clarify that where manual actuation of a traffic signal is required for pedestrians or bicyclists to call a signal phase to cross a roadway, traffic signs related to pushbuttons at those traffic signals are required. FHWA proposes this change to reduce the burden of sign installation on agencies.

In addition, FHWA proposes to add a new sign to the Option statement, allowing for the use of a PUSH BUTTON IS FOR AUDIBLE MESSAGE ONLY (R10-3j) sign to provide agencies with the option where a pedestrian pushbutton is only used to activate accessible pedestrian features. Similarly, FHWA proposes to add a new sign to the Option statement allowing for the use of a sign that indicates the pedestrian button can be activated by either pushing or waving.

Lastly, FHWA proposes to modify the legend of the R10-25 sign to "PUSH BUTTON FOR WARNING LIGHTS—WAIT FOR GAP IN TRAFFIC." FHWA proposes this change because these signs are used only at uncontrolled crosswalk locations where pedestrian-activated warning beacons only alert approaching traffic to the presence of a pedestrian, but do not assign right-of-way to conflicting traffic streams, such as with a traffic signal or hybrid-beacon. In such cases, pedestrians are required to wait for an acceptable gap in vehicular traffic and not enter the roadway in the path of a vehicle which is so close as to constitute an immediate hazard.

99. In Section 2B.60 (existing Section 2B.53) Traffic Signal Signs (R10-5 through R10-30), FHWA proposes to add Option and Guidance for the use of a text version of a LEFT TURN YIELD

ON FLASHING YELLOW ARROW (R10-12a) sign with Flashing Yellow Arrow signals. FHWA proposes this change to promote uniformity in the use of signing for these signal applications.

FHWA proposes to add new Standard, Support, Guidance, and Option statements regarding the use of a proposed new LEFT TURN YIELD TO Bicycles (R10-12b) sign to provide agencies with information regarding the use of this sign to notify turning motorists of the possibility for unexpected conflicting bicycle movement at certain locations.

FHWA also proposes to add provisions for a new WAIT ON STEADY RED—YIELD ON FLASHING RED AFTER STOP (R10-23a) sign as an alternative to the R10-23 sign at pedestrian hybrid beacons. The 2017 Traffic Control Devices Pooled Fund Study²⁷ evaluated the comprehension and legibility of various alternatives for signing at midblock hybrid beacon pedestrian crossings. The results indicated that no significant differences were found between the alternatives; however, they did highlight the need for a sign, at least initially, while drivers are learning what actions to take based on the flashing beacon. As a result, FHWA proposes to add a word message sign for jurisdictions that determine the operational need at pedestrian hybrid beacons.

FHWA also proposes to add an Option for a STOP HERE ON FLASHING RED (R10-14b) sign to provide extra emphasis at an emergency-vehicle hybrid beacon.

FHWA also proposes to add a Standard to accompany a proposed new optional Turning Vehicles Stop for Pedestrians (R10-15a) sign to remind drivers who are making turns to stop for pedestrians, which shall be used only in jurisdictions where laws, ordinances, or resolutions specifically require that a driver must stop for a pedestrian.

Lastly, FHWA proposes to add an Option statement allowing the use of a U TURN SIGNAL (R10-10a) sign adjacent to a signal face that exclusively controls a U turn movement.

100. In Section 2B.61 (existing Section 2B.54) No Turn on Red Signs (R10-11 Series, R10-17a, and R10-30), FHWA proposes to change the designations of the No Turn on Red signs such that the word only message signs are designated R10-11 and 10-11a and the NO TURN ON RED with the symbolic circular red sign is designated

as R10-11b. FHWA proposes this change to designate consecutively the word only message sign designations.

FHWA proposes to relocate existing Option P4 and revise Option P5 to indicate that a blank-out sign is the primary Option for displaying a part-time NO TURN ON RED restriction. In concert with this change, FHWA proposes an Option statement that allows the use of white LEDs in the border, and activated during periods of turn prohibition, to enhance sign conspicuity.

101. In Section 2B.62 (existing Section 2B.55), retitled, "Photo Enforced Signs and Plaques (R10-18, R10-19P, R10-19aP, R10-18a)," FHWA proposes to add a new optional Traffic Signal Photo Enforced (R10-18a) sign that may be installed on an approach to a signalized location where red-light cameras are present on any approach to the signalized location. FHWA proposes this new sign, and associated Option and Standard provisions, in accordance with Interim Approval (IA-12) issued November 12, 2010.²⁸

102. In Section 2B.66 (existing Section 2B.59) Weight Limit Signs (R12-1 through R12-7), FHWA proposes to add Guidance statements regarding the use of weight limit signs to indicate a structure has a vehicle weight restriction. FHWA proposes to add a Guidance statement recommending that the term used for units shown on weight limit signs be consistent within a State or region with respect to pounds or tons. FHWA also proposes that the vehicle weight restrictions be depicted based on gross vehicle weight, and that weight per axle or empty vehicle weight should only be used when required by local laws to depict weight restrictions in that manner. In conjunction with this change, FHWA proposes to delete existing Guidance P2 and P4 regarding axle weight limits. FHWA proposes this change, in concert with the new Option provisions related to Specialized Hauling Vehicles and the proposed R12-6 sign which allows for a more comprehensive posting gross weight based on axle configurations and vehicle types. The proposed sign allows for distinguishing a single-unit vehicle and a combination vehicle while restricting to other vehicle types or reducing the mobility of vehicles that should not be restricted.

FHWA proposes to delete existing Guidance P3 regarding restrictions on

²⁷ "Comprehension and Legibility of Selected Symbol Signs Phase IV" Pooled Fund Study can be viewed at the following internet website: <http://www.pooledfund.org/Document/Download/7559>.

²⁸ FHWA's Interim Approval IA-12, November 12, 2010, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia12/index.htm.

trucks in residential areas, because the sign is not conveying a weight restriction, but rather a selective prohibition of trucks in a neighborhood. A new NO THRU TRUCKS sign is being proposed in conjunction with this change in 2B.52 to convey more effectively the intent of the restriction.

FHWA also proposes to add Support and Option provisions related to Specialized Hauling Vehicles, which are single-unit trucks with closely spaced axles, for which weight limit signs displaying restrictions based on the number of axles may be used.

FHWA proposes to add several Standard statements regarding the symbols shown on the R12-5 and R12-6 Weight Limit signs. The symbols used are required to apply to all trucks of the type shown (single-unit, single-trailer or multi-trailer) regardless of the shape of the vehicle. Symbolic representations of other vehicle shapes or modifications of standard symbols shall not be used in accordance with existing requirements in Chapter 2A.

FHWA also proposes to add a Guidance statement recommending that Weight Limit signs show no more than 3 symbols in order to promote driver comprehension.

FHWA proposes to incorporate Guidance P7 into Standard P6 to require, rather than recommend that, if used, the Weight Limit sign, with an advisory distance ahead 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. FHWA proposes this change to give 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.

FHWA proposes provisions for the use of proposed new Emergency Vehicle Weight limit signs to address conditions where emergency vehicles can create higher load effects compared to legal loads. The R12-7 sign is for independent use and the R12-7aP plaque is for use only in a sign assembly below a primary regulatory Weight Limit sign.

103. FHWA proposes to renumber and retitle existing Section 2B.60 to "Section 2B.68 Vehicle Inspection Area Signs (R13-1 Series)" to provide more flexibility in the use of R13-1 signs for various types of inspections. In concert with this change, FHWA proposes to add an Option statement allowing modification to the legend to match the specific type of inspection conducted at

that station. FHWA also proposes to delete the existing Option statement allowing the reverse color combinations of the signs in order to support uniformity.

104. In Section 2B.68 (existing Section 2B.61) TRUCK ROUTE Sign (R14-1), FHWA proposes to change Option P2 to Support and revise the statement to provide specific reference to existing Section 2D.20 regarding the use of the TRUCK auxiliary sign on numbered alternative routes. FHWA proposes this change so as not to duplicate or conflict with the information contained in Chapter 2D.

105. FHWA proposes to add a new section numbered and titled, "Section 2B.71 Move Over or Reduce Speed Sign (R16-3)" with an Option statement regarding the use of the subject sign to require motorists to change lanes and/or reduce speed when passing stopped emergency vehicles on the shoulder.

106. FHWA proposes to renumber and retitle existing Section 2B.65 to "Section 2B.71 Minor Crashes Move Vehicles from Travel Lanes Sign (R16-4)" and rephrase the subject sign from "FENDER BENDER" to "MINOR CRASHES." FHWA proposes this change to align better with the various State laws and describe the type of crashes for which the sign is intended.

107. FHWA proposes to add a new section numbered and titled, "Section 2B.73 No Hand-Held Phones by Driver Signs (R16-15, R16-15a)" with an Option statement regarding the use of the subject sign, as State law applies, to notify drivers that they are prohibited from using hand-held telephones while driving.

108. In Section 2B.77 (existing Section 2B.68) Gates, FHWA proposes to delete Support P2 through P4 as they are not needed.

FHWA also proposes to revise existing Standard P5 to include a minimum width of the reflective sheeting. FHWA proposes this change to be consistent with the information provided in Part 8.

FHWA also proposes to delete existing Standard P9 and 10 and Guidance P12 regarding lateral offset of the gate arm and support, because this is addressed in AASHTO design criteria and reflects a design aspect better suited for other design manuals.

Discussion of Proposed Amendments to Chapter 2C Warning Signs and Object Markers

109. As part of the reorganization to improve usability of the MUTCD, FHWA proposes to include subchapter headings in Chapter 2C to organize sections into related groupings. FHWA

proposes the following subchapters in Chapter 2C: General, Horizontal Alignment Warning Signs, Vertical Grade Warning Signs and Plaques, Roadway Geometry Warning Signs, Roadway and Weather Condition Signs and Plaques, Traffic Control and Intersection Signs and Plaques, Merging and Passing Signs and Plaques, Miscellaneous Warning Signs, Supplemental Plaques, and Object Markers.

110. FHWA proposes to delete existing Section 2C.01 Function of Warning Signs because this information is captured in Chapters 1A and 2A.

111. FHWA proposes to renumber and retitle existing Section 2C.02 to "Section 2C.01 Function and Application of Warning Signs." FHWA also proposes to add a new Standard, referencing the existing requirements in Chapter 2A, requiring that all warning signs shall be retroreflective or illuminated. FHWA proposes this change for consistency with Section 2B.01.

FHWA also proposes to delete all the Option and Support statements because they restate information already covered in Chapter 1A.

112. In Section 2C.02 (existing Section 2C.03) Design of Warning Signs, FHWA proposes to add a Support regarding the use of shapes other than diamond-shaped for freeway overhead installations and a reference to Chapter 2A for information on modifications where lateral space is constrained.

FHWA proposes to revise Option P4 to clarify that word message warning signs other than those provided in this Manual may be developed and installed by State and local highway agencies for conditions not addressed by standard signs. FHWA proposes this additional language to clarify the allowable use of word message warning signs that are not in the MUTCD. FHWA proposes this clarification in response to an apparent misinterpretation of the existing provisions, in which noncompliant field deployments have unnecessarily modified the word legends of standard signs where used for the condition stated in the MUTCD.

Finally, FHWA proposes to add an Option statement allowing the use of static or flashing LEDs within the sign border to enhance the conspicuity of the sign.

113. In Section 2C.03 (existing Section 2C.04) Size of Warning Signs, FHWA proposes to revise the Guidance paragraph regarding the minimum size of diamond-shaped warning signs to restrict the provision to exit and entrance ramps at major interchanges connecting an expressway or freeway with an expressway or freeway. FHWA

also proposes to add a new Guidance statement recommending 36" x 36" as the minimum size for all diamond-shaped warning signs facing traffic on exit and entrance ramps at all other interchanges. FHWA proposes these changes because the operating characteristics of a single lane ramp can be closer to that of a single lane conventional roadway than that of a freeway, with the exception of freeway/expressway to freeway/expressway connections. The proposed language reaffirms the minimum recommended sizes and larger sizes can be used based on engineering judgement, when appropriate.

FHWA also proposes to add a Guidance statement regarding the size of warning signs used on low-volume rural roads with operating speeds of 30 mph or less to capture language in existing Part 5 FHWA proposes to redistribute among the remaining parts.

114. In Section 2C.04 (existing Section 2C.05) Placement of Warning Signs, FHWA proposes to delete the second sentence of P3 because it is not needed as the preceding guidance discusses placement with respect to perception-reaction time and the use of engineering judgment as well as referencing Section 2A for the placement of warning signs.

FHWA also proposes to delete P6 regarding the placement of warning signs that advise road users about conditions that are not related to a specific location, and instead include that information in Table 2C-4.

FHWA also proposes updates to Table 2C-4 by referencing the 2018 AASHTO Policy on Geometric Design of Highways and Streets, 7th Edition and providing for advance placement distances at higher speeds. FHWA also proposes to modify Condition B to place the AASHTO Stopping Sight Distance minimum design guidelines in the "0" column for STOP conditions placing Advance Traffic Control signs further in advance of the intersection providing greater advance notice of the critical intersection stop condition, a factor of safety for legibility distance, and more space on the intersection approach for lane control and guide signing.

115. In Section 2C.05 (existing Section 2C.06), retitled, "Horizontal Alignment Warning Signs—General," FHWA proposes to delete the Standard statement regarding use of horizontal alignment warning signs. Instead, FHWA proposes new Option and Guidance statements regarding various treatments, including items other than traffic control devices, and factors to consider for other traffic control devices to warn road users of a change in

horizontal alignment or to provide guidance in navigation. FHWA also proposes to delete existing Table 2C-5 and replace it with two tables in proposed Section 2C.06. As part of this change, FHWA proposes to move the portion of the Standard related to speed differential to proposed Section 2C.06 so that it appears in the same section with the referenced tables. FHWA proposes these changes based on a research study²⁹ that evaluated advance warning treatments at horizontal curves.

116. FHWA proposes to add a new section numbered and titled "Section 2C.06 Device Selection for Changes in Horizontal Alignment." This proposed new section contains Standard, Support, and Option statements, as well as new tables, to assist practitioners in determining the type of device to be used in advance of horizontal curves on freeways, expressways, and roadways. FHWA proposes this new section to assist practitioners with the selection of the appropriate device for warning of a change in horizontal alignment.

117. In Section 2C.07 Horizontal Alignment Signs (W1-1 through W1-5, W1-11, W1-15), FHWA proposes to edit and move P2 from a Standard to Guidance. FHWA proposes to recommend the use of a Turn (W1-1) sign instead of a Curve sign in advance of curves where the advisory speed is half or less of the posted speed or a speed differential of 25 mph or more. FHWA proposes these changes to allow engineering judgment if a Turn sign does not fit the field conditions. Also, the proposed change in criteria to a speed differential limits the use of the Turn sign where the sign would otherwise be required on lower speed roadways with small differentials between the posted speed and the advisory speed.

118. In Section 2C.08 (existing Section 2C.09) Chevron Alignment Sign (W1-8), FHWA proposes to add Option and Standard statements regarding the use of LEDs when used within Chevron Alignment signs to enhance the conspicuity.

119. FHWA proposes to delete existing Section 2C.10 Combination Supplemental Horizontal Alignment/Advisory Speed Signs (W1-1a, W1-2a), because there is considerable evidence that the signs are not being used as a supplement in accordance with the Standard, since many take on the form of an Advance Warning sign and are placed in advance, rather than at the

location of the hazard. To address the need to remind road users of the advisory speed at a location downstream of the advance warning location, FHWA proposes the Confirmation Advisory Speed Plaque (W13-1aP) described in proposed Section 2C.59.

120. In Section 2C.10 (existing Section 2C.12) One-Direction Large Arrow Sign (W1-6), FHWA proposes to revise Option P1 to allow use of the One-Direction Large Arrow sign either as a supplement or alternative to Chevron Alignment signs or delineators to delineate a change in horizontal alignment. FHWA proposes this change to reflect the results of a recent study on driver response to traffic control devices³⁰ and resulting desire to revise MUTCD language to clarify the use of devices in areas with change in horizontal alignment.

FHWA also proposes to delete Standard paragraph 7 prohibiting the use of the One-Direction Large Arrow sign in the central island of a roundabout and instead proposes to allow its use in a new Option. FHWA proposes to allow the use of the sign in conjunction with the proposed changes to remove existing Section 2B.43 for Roundabout Directional Arrow Signs. FHWA proposes these changes to provide agencies with an Option to use a warning sign within the roundabout instead of, or in addition to, a One-Way sign to direct traffic counter-clockwise around the central island. As part of these changes, FHWA proposes to add a Support statement referencing figures in Chapter 2B that show examples of regulatory and warning signs for roundabouts.

121. In Section 2C.11 (existing Section 2C.13), retitled, "Truck Rollover Sign (W1-13)," FHWA proposes to revise the existing Option statement to be more specific regarding locations where it may be appropriate to use the sign in lieu of a horizontal alignment warning sign. In addition, FHWA proposes to add a Guidance statement regarding the placement of the Truck Rollover sign. FHWA also proposes to add an Option allowing the use of a Vehicle Speed Feedback (W13-20) sign in conjunction with a Truck Rollover Warning sign.

122. FHWA proposes to combine existing Sections 2C.14 and 2C.15 and renumber and retitle the resulting section as, "Section 2C.12 Advisory Exit and Ramp Speed Signs (W13-2 and

²⁹ "Traffic Control Device Guidelines for Curves," Preliminary Draft Final Report, NCHRP Report 03-106, can be viewed at the following internet website: http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP03-106_FR.pdf.

³⁰ "Traffic Control Device Guidelines for Curves," Preliminary Draft Final Report, NCHRP Report 03-106, can be viewed at the following internet website: http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP03-106_FR.pdf.

W13-3) and Combination Horizontal Alignment/Advisory Exit and Ramp Speed Signs (W13-6 through W13-13).” FHWA proposes to add Standard, Guidance, and Option statements clarifying the use of these signs, including how they are to be used together, where applicable. FHWA also proposes to reference the proposed new tables in Section 2C.06.

In the proposed new Standard, FHWA proposes to require that the ramp geometries depicted on the Advisory Exit or Ramp Speed signs be limited to the standard designs of the proposed Combination Horizontal Alignment/Advisory Exit Speed and Combination Horizontal Alignment/Advisory Ramp Speed signs. While this limitation is implicit in the existing provisions of Section 2A.04 (existing Section 2A.06) that prohibit alternatives to standard signs or other uses of symbols, FHWA believes that a specific statement in this proposed Section would help to ensure that the proposed Combination signs are used only for those conditions at exit ramps that are atypical or unexpected. This limitation would minimize overuse of the Combination signs, which could result in a reduction of their effectiveness. Where typical or expected geometry exists at or near the ramp terminal, the Advisory Exit or Ramp Speed (W13-2 or W13-3) signs would continue to be used. FHWA proposes these new signs to provide agencies and practitioners greater flexibility to sign for various unexpected conditions at or near ramp terminals. In addition to the existing signs in the Manual that display the 270-degree loop arrow (W13-6 and W13-7), FHWA proposes Exit and Ramp Combination signs depicting the following geometric conditions: The 180-degree horseshoe curve arrow, the 90-degree turn arrow, and the truck rollover symbol and arrow. In this new Standard, FHWA also proposes to incorporate an existing requirement previously contained in Table 2C-5 for the use of Advisory Exit Speed and Advisory Ramp Speed signs on turning roadway exits and ramps when the difference between the speed limit and the advisory speed is 20 mph or greater.

FHWA also proposes to recommend in a new Guidance that the Advisory Exit Speed and Advisory Ramp Speed signs on turning roadway ramps be used when the difference between the speed limit and the advisory speed is 15 mph or greater. FHWA also proposes to add that Regulatory Speed Limit signs should not be located in the vicinity of exit ramps or deceleration lanes, particularly where they would conflict with the advisory speed displayed on the Advisory Exit or Ramp Speed signs.

In a revised Option, where there is a need to remind road users of the recommended advisory speed, FHWA proposes to allow a horizontal alignment warning sign with an advisory speed plaque to be installed at a downstream location along the ramp.

FHWA proposes new Guidance for the installation of a horizontal alignment warning sign if there are changes to the ramp curvature and the subsequent curves have advisory speeds that are lower than the initial ramp curve speed.

FHWA also proposes a new Option for the use of the One-Direction Large Arrow (W1-6) sign beyond the exit gore on the outside of the curve to provide additional warning of an immediate change in curvature.

FHWA proposes the changes in this new combined section to clarify the use of these signs and provide additional flexibility for their use on ramps where the speed differential is small, or where road users need reminding of the advisory speed.

123. FHWA proposes to add a new section numbered and titled, “Section 2C.13 Vehicle Speed Feedback Sign (W13-20, W13-20aP),” that contains Option, Standard, and Guidance paragraphs regarding the use of an LED sign to displays the speed of an approaching vehicle back to the vehicle operator to provide warning to drivers of their speed in relation to either a speed limit or horizontal alignment warning advisory speed sign. FHWA proposes this new section to provide additional information regarding the use of these signs and plaques, as well as references to other portions of the Manual to assist with uniformity in the use of the signs and plaques.

124. In Section 2C.14 (existing Section 2C.16) Hill Signs (W7-1, W7-1a), FHWA proposes to remove the Standard in P5 requiring that the percent grade supplemental plaque be placed below the Hill (W7-1) sign as the Standard for the placement of a plaque below a sign is contained in Section 2C.57 “Use of Supplemental Warning Plaques.” FHWA proposes this change to remove unnecessary or repetitive content and streamline the Manual.

125. In Section 2C.16 (existing Section 2C.18) HILL BLOCKS VIEW Sign (W7-6), FHWA proposes to revise the Option and to add Guidance to indicate that the HILL BLOCKS VIEW sign may be used on the approach to a crest vertical curve where the vertical curvature provides inadequate stopping sight distance at the posted speed limit, and that where such curve results in a sight distance obstruction to a specific condition beyond the crest of the

vertical curve, the sign for the specific condition beyond the vertical crest should be used rather than the HILL BLOCKS VIEW sign. FHWA proposes these changes to provide agencies with options to provide more specific guidance to conditions to road users about conditions ahead.

126. In Section 2C.18 (existing Section 2C.20), retitled, “NARROW BRIDGE and NARROW UNDERPASS Signs (W5-2, W5-2a)” and in Section 2C.19 (existing Section 2C.21), retitled, “ONE LANE BRIDGE and ONE LANE UNDERPASS Signs (W5-3, W5-3a),” FHWA proposes to add Option statements that allow for the respective sign to be omitted on low-volume rural roads to capture language from existing Part 5 that FHWA proposes to redistribute among the remaining parts.

In addition, FHWA proposes to add NARROW UNDERPASS and ONE LANE UNDERPASS signs where the same conditions exist for an underpass.

127. In Section 2C.24 (existing Section 2C.26), retitled, “DEAD END, NO OUTLET, and ROAD ENDS Signs (W14-1, W14-1a, W14-2, W14-2a, W8-26, W8-26a),” FHWA proposes to change the term “cul-de-sac” to “turn-around” in Option P1 to reflect the roadway geometry more accurately.

FHWA proposes to delete Standard P4 prescribing the design of the sign, because sign design details are required to comply with existing requirements in Chapter 2A.

Lastly, FHWA proposes to add a new Option for signs for ROAD ENDS and STREET ENDS for use on the approach to the end of a conventional road or street. In concert with these new signs, FHWA also proposes a Guidance paragraph recommending the use of object markers to mark the end of the road or street if the new signs are used, presuming that the need for the sign would be based on low visibility of the end of the road or street. FHWA also proposes a Standard statement prohibiting the use of the proposed new ROAD ENDS and STREET ENDS signs at the entrance to a dead end road or street as the DEAD END and NO OUTLET signs are designated specifically for that purpose.

128. In existing Section 2C.27, renumbered and retitled, “Section 2C.25 Low Clearance Signs (W12-2, W12-2a, W12-2b),” FHWA proposes several revisions to clarify the signing practice for locations where the clearance is less than 12 inches above the statutory maximum vehicle height. FHWA proposes these changes to provide agencies with additional information for placing signs in advance of and on structures with low clearance. The

proposed changes were based on recommendations from NTSB H-14-11 to provide signing indicating the proper lane of travel for over height vehicles traveling under an arched structure.³¹ As part of these changes, FHWA proposes to designate the existing W12-2 sign as a Low Clearance Ahead sign, and the existing W12-2a and a proposed new W12-2b sign as a Low Clearance Overhead sign, to indicate the portion of the structure with low clearance if the posted clearance does not apply to the entire structure. FHWA proposes a compliance date of 5 years based on the critical nature of the infrastructure.

129. In Section 2C.26 (existing Section 2C.28) BUMP and DIP Signs (W8-1, W8-2), FHWA proposes to change P3 from a Standard to a Guidance statement to discourage, rather than prohibit, the use of the DIP sign at a short stretch of depressed alignment that might hide a vehicle momentarily. FHWA proposes this change to give agencies more flexibility in the placement of the DIP sign.

130. In Section 2C.28 (existing Section 2C.39) DRAW BRIDGE Sign (W3-6), FHWA proposes to delete the exception for use of a DRAW BRIDGE sign in urban conditions because it is not necessary.

131. In Section 2C.30 (existing Section 2C.31) Shoulder Signs (W8-4, W8-9, W8-17, W8-23, and W8-25), FHWA proposes to delete Standard P7 requiring that Shoulder signs be placed in advance of the condition, because that requirement is applicable to almost all warning signs, and therefore is not needed as a separate Standard in this section.

132. FHWA proposes to add a new section numbered and titled, "Section 2C.34 NO TRAFFIC SIGNS Sign (W18-1)," that contains an Option statement that captures language from existing Part 5 that FHWA proposes to redistribute among the remaining parts.

133. In Section 2C.35 Weather Condition Signs (W8-18, W8-19, W8-21, and W8-22), FHWA proposes to change Standard P2 to a Guidance to provide agencies with flexibility in the placement of the Depth Gauge sign.

134. In Section 2C.36 Advance Traffic Control Signs (W3-1, W3-2, W3-3, W3-4), FHWA proposes to change the last sentence of Standard P1 related to visibility criteria for traffic control signals based on distances specified in Table 4D-2 to a Guidance to allow agencies more flexibility.

³¹ NTSB Safety Recommendation H-14-11, is available at the following internet website: <https://www.ntsb.gov/investigations/AccidentReports/Reports/HAR1401.pdf>.

FHWA also proposes to combine and revise existing Option statements to allow for the use of LEDs within the border of the sign to enhance conspicuity.

135. FHWA proposes to add a new section numbered and titled, "Section 2C.37 Actuated Advance Intersection Signs (W2-10 through W2-12)," that contains Support, Option, and Standard paragraphs regarding the use of Actuated Advance Intersection Signs to allow agencies flexibility in implementing warning systems in the vicinity of traffic signals or other intersection conflict areas. FHWA proposes these signs, and the associated legends, based on information from a Pooled Fund Study.³²

136. FHWA proposes to renumber and retitle existing Section 2C.52 as, "Section 2C.39 NEW TRAFFIC PATTERN and SIGNAL OPERATION AHEAD Signs (W23-2, W23-2a)" to add a proposed new optional sign that agencies may use to warn road users of changes in signal phasing.

137. In Section 2C.40 (existing Section 2C.38) Reduced Speed Limit Ahead Signs, FHWA proposes to add the Variable Speed Zone (W3-5b) and Truck Speed Zone (W3-5c) Ahead signs in the Guidance and Standard paragraphs to provide agencies with standard signs to be used to inform road users in advance of these reduced speed zone types.

138. FHWA proposes to add a new section numbered and titled, "Section 2C.41 WATCH FOR STOPPED TRAFFIC Sign (W23-3)." The new section contains an Option to use a new WATCH FOR STOPPED TRAFFIC Sign (W23-3) to warn road users of the possibility of vehicles stopped unexpectedly in the travel lane. FHWA proposes this change based on Synthesis of Non-MUTCD Signing,³³ which found that at least 20 State agencies currently use a sign that warns of the possibility of stopped or almost stopped traffic due to turns or other unexpected conditions, and therefore recommends adding the sign to the MUTCD. In accordance with this recommendation, FHWA proposes to add the W23-3 to Figure 2C-4 and Table 2C-1.

139. In Section 2C.42 (existing Section 2C.46) Intersection Warning Signs (W2-1 through W2-8), FHWA

³² Intersection Conflict Warning System Human Factors: Final Report, dated November 2016 can be viewed at the following internet website: <https://www.fhwa.dot.gov/publications/research/safety/16061/16061.pdf>.

³³ Synthesis of Non-MUTCD Signing can be viewed at the following internet website: https://rosap.nsl.bts.gov/view/dot/34772/dot_34772_DS1.pdf.

proposes to remove Option P5 regarding the design of intersection warning signs to remove language that implies certain classifications of roadways at an intersection may be of lesser importance.

FHWA proposes to revise Guidance P8 to exclude Grade Crossing and Intersection Advance Warning (W10-2 and W10-3) signs from Intersection Warning signs that are prohibited on approaches controlled by STOP signs, YIELD signs, or signals. FHWA proposes this change because of the safety importance associated with these signs.

140. In Section 2C.43 (existing Section 2C.47) Two-Direction Large Arrow Sign (W1-7), FHWA proposes to delete Standard P4 prohibiting the use of a Two-Direction Large Arrow Sign in the central island of a roundabout. FHWA proposes this change because the MUTCD provides considerable guidance and numerous examples of proper signing at roundabouts and the use of the sign as described in the statement is contrary to the definition of a roundabout and relevant MUTCD provisions.

141. FHWA proposes to renumber and retitle existing Section 2C.48 to "2C.44 Traffic Signal Oncoming Extended Green Signs (W25-1, W25-2)." FHWA proposes to delete the last sentence of Standard P1 regarding the sign shape and orientation because the design is standardized.

142. In Section 2C.45 (existing Section 2C.40) Merge Signs (W4-1, W4-5), FHWA proposes to add a new Guidance paragraph with recommendations for the orientation and location of the Merge signs. FHWA also proposes to add a new Figure 2C-11 illustrating the use of Merge signs.

Lastly, FHWA proposes to change the existing Guidance P7 to a Standard to prohibit the Merge sign from being used for a lane reduction rather than a merging roadway. FHWA proposes this change to clarify the purpose of the signs because standard signs already exist to sign for the condition of a lane termination and the Merge symbol sign is not intended for any general merging action. Rather, it is intended specifically for the condition in which two roadways merge, such as two ramps or a ramp and main highway.

143. In Section 2C.46 (existing Section 2C.41), "Added Lane Signs (W4-3, W4-6)," FHWA proposes to add a new Guidance paragraph with recommendations for the orientation and location of the Added Lane signs. FHWA also proposes to illustrate the use of the Added Lane signs on new Figure 2C-12.

144. In Section 2C.47 (existing Section 2C.42), retitled “Lane Ends Signs (W4–2, W9–1),” FHWA proposes several changes to reflect the proposed deletion of the LANE ENDS MERGE LEFT (RIGHT) (W9–2) sign. FHWA proposes deleting this sign, and instead adds new Support and Guidance statements to clarify the use of the Lane Ends (W4–2) and RIGHT (LEFT) LANE ENDS (W9–1) signs, including how to use them together, where applicable, to warn road users of the reduction in the number of lanes. FHWA proposes a Guidance statement to clarify the Lane Ends (W4–2) sign should be used to indicate the approximate location of the start of the lane taper. FHWA proposes these changes and the deletion of the W9–2 sign to provide consistency in signing for a reduction in the number of lanes, as the W9–2 sign is a word message for which a symbol sign (W4–2) already exists. In addition, a research study³⁴ which examined the use of these signs, as well as new alternatives, showed that the W4–2 and W9–1 had the best recognition, while the W9–2 sign had a greater legibility distance.

FHWA proposes a new Option that allows the W9–1 sign to be located at the far-side of the intersection on low-speed roads in urban environments where space is limited at a signalized intersection. FHWA also proposes allowing supplemental RIGHT (LEFT) LANE ENDS (W9–1) signs upstream of the W9–1 that is installed at the advance placement distance.

FHWA proposes a new Guidance statement to recommend that if supplemental W9–1 signs are installed, a Distance plaque should be installed below the W9–1 sign.

145. FHWA proposes to add a new Section numbered and titled, “2C.48 Lanes Merge Signs (W9–4, W4–8)” and proposes new LANES MERGE (W9–4) and Single-Lane Transition (W4–8) signs to warn of the reduction of two lanes to one in the same direction of travel.

FHWA proposes new Guidance paragraphs for the Lanes Merge (W9–4) sign to be used to warn that the traffic lane is merging with the adjacent lane and a merging maneuver would be required, and for the Single-Lane Transition (W4–8) sign to be used to indicate the approximate location of the start of the lane taper.

146. FHWA proposes to add a new section numbered and titled, “Section 2C.49 HEAVY MERGE FROM LEFT

(RIGHT) Sign (W4–7).” The new section contains an Option to use a new HEAVY MERGE FROM LEFT (RIGHT) XX FT Sign (W4–7) to provide supplemental warning to advise road users of congested lanes at interchanges. A sign with the legend THRU TRAFFIC MERGE LEFT (RIGHT) was proposed in the 2008 NPA but was not adopted in the Final Rule. FHWA received a request to include the THRU TRAFFIC sign based on the Synthesis of Non-MUTCD Signing,³⁵ which found that at least 11 State agencies currently use such a sign and it should therefore be added to the MUTCD. FHWA proposes to add the W4–7 with a HEAVY MERGE FROM LEFT (RIGHT) XX FT legend to Figure 2C–8 and Table 2C–2 as this legend depicts the warning to drivers more accurately of the potential for a large volume of entering traffic rather than the THRU TRAFFIC legend, which warns through traffic to vacate those lanes, because it implies that the lane is ending. The MUTCD already contains standard signs to indicate that a lane is either ending or is for exit traffic only.

147. FHWA proposes to renumber and retitle existing Section 2C.43 to “Section 2C.50 RIGHT (LEFT) LANE FOR EXIT ONLY Sign (W9–7).” FHWA also proposes to delete Standard P2 regarding the sign shape and color because the design is standardized.

In addition, FHWA proposes to add an Option statement that allows for the addition of a third line of legend that displays the distance to the exit if it is more than 1 mile away.

148. FHWA proposes to add a new section numbered and titled, “Section 2C.52 Two-Way Traffic on a Three-Lane Roadway Sign (W6–5, W6–5a)” with an Option and Standard statement associated with the new sign. FHWA proposes this new optional sign to provide agencies with a standardized sign to use in locations where such a sign may be necessary to provide road users with the proper warning for the roadway configuration.

149. In Section 2C.54 (existing Section 2C.49), “Vehicular Traffic Warning Signs (W8–6, W11–1, W11–5, W11–8, W11–10, W11–11, W11–12P, W11–14, W11–15, and W11–15a),” FHWA proposes eliminating sign W11–5a because the secondary version of the Farm Machinery sign is isometric and inconsistent with the standard symbol design principles.

FHWA also proposes to add the IN STREET and IN ROAD optional

supplemental plaques to expand the options available to agencies to indicate that non-motorized users may be in the roadway. FHWA proposes to delete the SHARE THE ROAD supplemental plaque, as discussed below.

150. FHWA proposes to renumber and retitle existing Section 2C.08 as, “Section 2C.59 Advisory Speed Plaque (W13–1P) and Confirmation Advisory Speed Plaque (W13–1aP)” to reflect the proposed addition of a new use for the optional plaque to supplement a One-Direction Large Arrow Sign (W1–6) to remind road users of the advisory speed through the curve. The proposed W13–1aP plaque is redesignated from E13–1P, which is an existing plaque currently allowed beneath Exit Gore signs to confirm the advisory exit speed posted at an upstream location. FHWA proposes to redesignate this plaque and expand its use to the similar application on the outside of the beginning of any alignment change following a Horizontal Alignment Advance Warning sign assembly. The proposed expanded use of this plaque would replace the existing Combination Horizontal Alignment/Advisory Speed signs in existing Section 2C.10. In concert with this change, FHWA proposes a new Standard paragraph limiting the allowable use of the Confirmation Advisory Speed plaque only to supplement a One-Direction Large Arrow (W1–6) or an Exit Gore (E5–1 series) sign and not as a separate sign installation. FHWA proposes this limitation on the use of the plaque because the plaque was designed and intended specifically for these two uses, which are to supplement, near the beginning of the alignment change, an advisory speed that is posted at the advance location in an Advance Warning sign assembly.

FHWA also proposes to delete existing Items A through C in Support P7 and all of Support P8, and instead refer to the Traffic Control Devices Handbook for information on established engineering practices for determining advisory speeds for a horizontal curves. As part of this change, FHWA proposes to add items A through E, which list established engineering practices.

151. In Section 2C.60 (existing Section 2C.62) NEW Plaque (W16–15P), FHWA proposes to delete Standard P2 prohibiting the NEW plaque from being used alone because Section 2C.57 (existing Section 2C.53) already contains a similar Standard.

FHWA also proposes to change Standard P3 to Guidance to give agencies more flexibility to retain the NEW plaque longer than 6 months after

³⁴ “Comprehension and Legibility of Selected Service Symbol Signs Phase IV” Final Report, dated December 2017 can be viewed at the following internet website: <https://pooleedfund.org/Document/Download/7559>.

³⁵ The Synthesis of Non-MUTCD Signing can be viewed at the following internet website: https://rosap.nrl.bts.gov/view/dot/34772/dot_34772_DS1.pdf.

the regulation has been in effect, if necessary.

152. FHWA proposes to delete existing Section 2C.60 SHARE THE ROAD Plaque (W16–1P) and replace it with a new proposed Section 2C.66 IN ROAD and IN STREET Plaques (W16–1P, W16–1aP) that contains Option and Standard statements regarding the use of these optional signs to warn drivers to watch for other forms of slower transportation traveling along the highway, such as bicycles, golf carts, or horse-drawn vehicles. Since its adoption in the 2000 MUTCD, research³⁶ has shown that the “share the road” message when applied to bicyclists does not adequately communicate the responsibilities of either user group on the roadway. Road users are unclear whether “share the road” means that drivers should give space when passing or that bicyclists should pull to the side to allow drivers to pass. FHWA is proposing the IN ROAD/IN STREET plaques to replace the SHARE THE ROAD plaque based on this research and for consistency with all in road vehicle types.

153. FHWA proposes to add a new section numbered and titled, “Section 2C.67 Except Bicycles Plaque (W16–20P).” The new section contains an Option to use a new Except Bicycles plaque below a warning sign where it is appropriate to notify bicyclists that the conditions depicted by a warning sign are not applicable to bicycles. An example is a roadway which terminates as a dead end or cul-de-sac but serves as a continuous route for bicycle travel through the use of connecting paths or barrier opening and the plaque would be used to supplement a DEAD END or NO OUTLET warning sign. This section also includes a new Standard statement that if used with a warning sign, the plaque shall be a rectangle with a black legend and border on a yellow background, consistent with similar provisions for the color of supplemental plaques.

154. In Section 2C.71 (existing Section 2C.65) Object Markers for Obstructions Adjacent to the Roadway, FHWA proposes to add a new Option permitting the use of Type 2 or Type 3 object markers to mark an obstruction adjacent to the roadway. The existing MUTCD has a Standard that currently implies this optional use of Type 2 and Type 3 object markers. FHWA proposes

this change to clarify the intent of the provisions.

FHWA also proposes to change existing Standard P2 and P3 to Guidance and revise the language regarding object markers applied to approach ends of guardrail and other roadway appurtenances to specify crash cushion terminals as the other roadway appurtenances. The revision also recommends that the Type 3 object marker should be directly affixed, without a substrate, and generally conform to the size and shape of the approach end of the guardrail or crash cushion. FHWA proposes this change because the term “roadway appurtenances” is not defined in the MUTCD and FHWA wants to eliminate any potential confusion that may occur between this Guidance paragraph and the existing Support statement in this section which lists numerous obstructions where object markers are applied.

Discussion of Proposed Amendments to Chapter 2D Guide Signs—Conventional Roads

As part of the reorganization to improve usability of the MUTCD, FHWA proposes to include subchapter headings in Chapter 2D to organize sections into related groupings. FHWA proposes the following subchapters in Chapter 2D and associated sections (referenced to the proposed section numbers): General Design (Sections 2D.01 through 2D.08), Route Signs and Auxiliary Plaques (Sections 2D.09 through 2D.28), Sign Assemblies (Sections 2D.29 through 2D.34), Destination and Distance Signs (Sections 2D.35 through 2D.44), Street Name and Parking Signs (Sections 2D.45 through 2D.48), Freeway Entrance Signs (Sections 2D.49 and 2D.50), Weigh Station, Truck, and Crossover Signs (Sections 2D.51 through 2D.54) and Other Guide Signs (Sections 2D.55 through 2D.59).

155. In Section 2D.01 (existing Section 2D.02), retitled, “Scope of Conventional Road Guide Sign Standards and Application,” FHWA proposes to relocate existing Guidance and Support statements regarding low-volume roads from Chapter 5D. FHWA proposes the change to place all related material regarding guide signs together.

FHWA also proposes a new Guidance statement recommending that the primary or control destinations displayed on guide signs be meaningful to road uses in navigation and orientation, and that such destinations be identifiable on official maps. FHWA proposes this change to provide

consistency in the use of destinations on guide signs.

FHWA also proposes a new Support statement to indicate that guide signs, other than Street Name signs, are generally not used on low-volume rural roads, except as needed to guide road users back to major roadways.

FHWA also proposes to add new Support and Guidance statements, along with a new figure, describing signing for airport facility roadways. This information is based on a study by the National Academy of Sciences³⁷ that examined airport roadway user informational needs and limitations.

156. In Section 2D.05 (existing Section 2D.06), FHWA proposes to add a Standard statement that the minimum letter and numeral height of the principal legend on conventional road overhead signs be at least 12 inches in height for upper-case letters and 9 inches in height for lower-case letters. An Option is also proposed to allow 10.67 inches in height for upper case letters and 8 inches in height for lower-case letters for such roadways with posted speed limits of 40 miles per hour or less. FHWA proposes this change to ensure adequate letter height to meet road user legibility needs for conventional roadway overhead guide signs based on speed of travel.

157. FHWA proposes to add a new section numbered and titled, “Section 2D.07 Abbreviations.” FHWA proposes to relocate information from existing Section 2E.17 to Chapter 2D because it also applies to guide signs for conventional roadways. FHWA also proposes to add a new figure and two new tables that are specific to the use of the types of abbreviations described in this Section.

FHWA proposes a new Support statement identifying that the use of commonly recognized abbreviations for certain words can be useful in reducing the complexity of the sign message.

158. In Section 2D.08 Arrows, FHWA proposes to designate “curved-stem arrows” as “Type E directional arrows” and that they be associated exclusively with circular intersections. FHWA proposes this change to provide consistency in terminology throughout the Manual. In concert with this change, FHWA proposes several revisions within this section to reflect this terminology and to provide additional flexibility for agencies to represent

³⁶ The Article, “Bicycles May Use Full Lane” Signage Communicates U.S. Roadway Rules and Increases Perception of Safety,” by George Hess and M. Nils Peterson, published August 28, 2015, can be viewed at the following internet website: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0136973#sec013>.

³⁷ “Wayfinding and Signing Guidelines for Airport Terminals and Landside,” TRB’s Airport Cooperative Research Program (ACRP) Report 52, 2011, can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/165910.aspx>.

intended driver paths on guide signs for circular intersections.

159. In Section 2D.09 Numbered Highway Systems, FHWA proposes to revise the Standard regarding route system order preference to provide an exception to the order because there may be instances where a different prioritization might better accommodate driver expectancy. In concert with the Standard revision, FHWA also proposes to add an Option statement allowing the modification of the prioritization of route systems.

FHWA also proposes to add a Standard reflecting the existing requirement that Interstate route numbering be approved by FHWA consistent with 23 CFR 470.115(a).

160. In Section 2D.11 Design of Route Signs, FHWA proposes to revise the first Standard paragraph to clarify the requirement that Interstate Route, Off-Interstate Business Route, U.S. Route, State Route, County Route, and Forest Route sign legends are required to comply with existing requirements in Chapter 2A.

FHWA also proposes to revise the Standard paragraph regarding County Route sign dimensions to require a minimum size of 24 x 24 inches for consistency with the minimum sizes for other Route signs.

FHWA also proposes to revise Option paragraph 4 to designate the existing optional sign (Interstate Route sign that includes the State name) as M1-1a and to allow the optional use of this sign in place of the M1-1 sign when the Interstate Route sign is used in a Route Sign assembly. In concert with this change, FHWA proposes a new Standard statement limiting the use of the M1-1a sign to Route Sign assemblies to clarify that the allowable optional use does not extend to other types of signs, such as when the Interstate Route sign is used within a guide sign, to limit the informational load imposed on the road user and because the relative scale of the State name to other legend elements displayed on the guide sign would be considerably smaller.

FHWA also proposes to delete the Option P7 and P16 statements regarding Route Signs used on a green guide sign that allow for the use of a white or yellow background to improve contrast, because FHWA has revised the design of the Off-Interstate Business Route and County Route signs to include a wider border to address contrast.

FHWA also proposes to add a Standard statement to reiterate the existing requirement of the legend on State Route signs to conform to Standard Alphabets, for consistency. FHWA proposes this change as a

conforming edit, which would not change the existing underlying requirement in Chapter 2A.

FHWA proposes to amend the subsequent Guidance paragraph to limit the use of complex graphics to maintain consistency.

FHWA also proposes to revise the Standard paragraph regarding Route Signs for parks and forest roads to clarify the existing requirement to comply with the existing provisions of Chapter 2A, and to clarify that the provisions for the design of park and forest Route signs apply to non-National Forest routes.

161. In Section 2D.12, retitled, "Design of Route Sign Auxiliary Plaques," FHWA proposes to delete the Guidance paragraph regarding Route Signs of larger heights because the sizes are standardized based on roadway classification, corresponding to the Route Sign sizes.

FHWA also proposes to change the existing Guidance paragraph to a Standard regarding the color and design of a combination route sign with auxiliary plaques into a single guide sign, consistent with sign color requirements for guide signs elsewhere in the MUTCD.

162. In Section 2D.16, retitled, "Auxiliary Plaque for Alternative Routes (M4-1P through M4-4P)," FHWA proposes to modify the section title because the Option and Standard paragraphs contained within this section do not apply to the entire M4 series of signs.

163. In Section 2D.17, retitled, "ALTERNATE Auxiliary Plaques (M4-1P, M4-1aP)," FHWA proposes to add a Standard paragraph to prohibit the use of the M4-1P Series plaques to sign alternative routing not officially incorporated into the numbered highway system, such as alternative routings for incident management or emergency detours. FHWA proposes this additional paragraph to ensure the M4-1P Series plaques are used in a consistent manner with their stated meaning in this section.

164. In Section 2D.29 Route Sign Assemblies, FHWA proposes to add a Guidance paragraph and new figure recommending that when more than four Route signs are needed in a single Advance Route Turn or Directional assembly, the Route signs should be mounted in a Guide sign. FHWA proposes this guidance as this would reduce the significant informational load on the road user of such assemblies by reducing the repetition of the cardinal direction and directional arrows.

FHWA also proposes an Option paragraph allowing Route Signs to be omitted for routes that are part of an agency's internal numbering system, such as for maintenance or other purposes, and are not publicly mapped or intended to be used for navigational purposes by the general public. FHWA proposes this Option to allow agencies flexibility as to whether to post signs in certain areas.

165. In Section 2D.34 (existing Section 2D.35) Trailblazer Assembly, FHWA proposes to revise the Option statement to clarify the use of a Cardinal Direction auxiliary plaque only for routes that provide access to one direction of the route.

166. In Section 2D.35 (existing Section 2D.36) Destination and Distance Signs, FHWA proposes to relocate a Guidance paragraph previously contained in Section 5D.01 regarding destination names on low-volume roads.

167. In Section 2D.36 (existing Section 2D.37) Designation Signs (D1 Series), FHWA proposes to add a new Support paragraph to describe the use of overhead destination guide signs on multi-lane conventional roadways with complex or unusual roadway alignments to help drivers.

FHWA also proposes to add a new Option paragraph suggesting overhead signs using the Arrow-Per-Lane sign design configuration may be used to provide lane assignments for some or all lane designations at the approach to a multi-lane intersection for clarification.

168. FHWA proposes to add a new section numbered and titled, "Section 2D.37 Overhead Arrow-Per-Lane Destination Guide Signs," to provide information, requirements, guidance, and a figure related to the use of these signs on multi-lane conventional roadway intersections, often associated with complex or unusual roadway alignments using innovative intersection designs to improve traffic flow and safety.

169. In Section 2D.39 (existing Section 2D.38) Destination Signs at Circular Intersections, FHWA proposes to revise the Support paragraph regarding the use of diagrammatic guide signs for circular intersections to help ensure that the basic principles of limiting the amount of legend and aligning the arrows with each destination are applied. FHWA proposes this clarification to aid road users in understanding the sign and navigation through the area.

170. In Section 2D.40 (existing Section 2D.39) Destination Signs at Jughandles, FHWA proposes to delete the Option allowing the use of diagrammatic guide signs depicting the

travel path and turns through several intersections, because diagrammatic signs are limited to circular or successive intersections.

171. FHWA proposes to add a new section numbered and titled, "Section 2D.41 Destination Signs at Intersections with Indirect Turning Movements," that contains a Guidance paragraph regarding the use of guide signs and pavement markings to direct traffic, and a new figure illustrating examples of destination signs at intersections with indirect turning movements. FHWA proposes this new section to provide agencies with examples of proper signing for locations with displaced left turn and intercepted crossroad intersections, which are newer intersection designs and becoming more common in practice and provide for consistency.

172. In Section 2D.45 (existing Section 2D.43), retitled, "Street Name Signs (D3-1, D3-1a)," FHWA proposes to add a Guidance paragraph regarding the use of Street Name signs at intersections of freeway exit ramps with cross roads to help minimize the potential for wrong-way movements onto the freeway ramp.

FHWA also proposes to add Guidance regarding the engineering considerations that should be used to determine the letter heights used on Street Name signs at specific locations.

FHWA also proposes to revise the Support paragraph regarding minimum letter heights to clarify that the minimum letter heights apply to the roadway that each sign faces, rather than to the street that has its name displayed on the Street Name sign.

FHWA also proposes to add an Option paragraph to allow different letter heights in a sign assembly based on the speed limit in order to clarify that agencies may use different letter heights on different signs at the same intersection.

FHWA also proposes to revise existing Option P9 to clarify that the letter height of the street name descriptor, the directional legend, or any other supplemental legend on the D3-1 and D3-1a signs may be smaller than that of the street name itself, while maintaining the letter size proportions between the street name and supplemental information on the sign. In concert with this Option, FHWA proposes to add Guidance that smaller letter legend should be at least two-thirds of the letter height of the street name itself, but not less than 3 inches for the initial upper-case letters and not less than 2.25 inches for the lower-case letters for adequate legibility. In addition, FHWA proposes to change the

remainder of the first sentence and the second sentence in existing Option in P9 regarding the use of conventional abbreviations for all information on the Street Name sign other than the street name itself to Guidance, and to provide a new table of acceptable street name descriptors and a table of street name descriptors that should not be used. FHWA proposes these changes to provide consistency with guide signs and to encourage the use of conventional abbreviations to reduce the size of the sign and for more rapid recognition.

FHWA also proposes to add a Guidance statement regarding the proportional letter height of a supplemental legend to be consistent with guide signs and the letter heights that are used.

FHWA also proposes to add Option and Guidance statements allowing the use of block or house numbers as a supplemental legend on Street Name signs and recommending the application of house numbers for the left and right blocks of the cross street.

FHWA also proposes to delete a sentence in existing P14 regarding requirements for sign color and retroreflectivity because allowable colors for the legend and border are already included in existing P18 of this section and requirements for retroreflectivity are covered in existing Section 2A.07.

FHWA also proposes to add a Guidance statement regarding the omission of the border on a post-mounted Street Name sign to clarify that the decision to omit the border should be based on factors related to providing for adequate recognition of the sign by road users.

FHWA also proposes to add a Guidance statement that recommends that Street Name signs display the street name on both sides of the sign to facilitate navigation for pedestrians.

FHWA also proposes to revise the Option regarding the use of arrows where the same road has two different street names. Additional information has been added to clarify that this option is not allowed where arrows would point in a movement direction that is not allowed.

FHWA also proposes to add a Guidance paragraph regarding streets or segments thereof that have been memorialized or dedicated. Second Street Name signs should not be used to display the memorial or dedication name. Memorial or Dedication signs should be located to minimize conspicuity the potential for confusion by road users.

Finally, FHWA proposes to add a Support statement referring users to Section 2I for information on the identification of streets at overcrossings and undercrossings.

173. In Section 2D.46 (existing Section 2D.44), retitled, "Advance Street Name Signs (D3-2 Series)," FHWA proposes to revise the Standard statement regarding the legend and background color of Advance Street Name signs to clarify that the use of alternative colors is prohibited, repeating an existing Standard statement from Section 2D.43. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement, to clarify that Advance Street Name signs must have green backgrounds.

174. In Section 2D.47 Parking Area Guide Sign (D4-1), FHWA proposes to revise the Standard paragraph to delete the design and color information for the sign, because design is standardized in accordance with the existing requirements in Chapter 2A.

175. In Section 2D.49 (existing Section 2D.45) Signing on Conventional Roads on Approaches to Interchanges, FHWA proposes to add a Support statement that provides reference to new figures that offer examples of guide signing for single-point urban intersection and transposed-alignment crossroads, which are becoming more common in practice.

176. In Section 2D.51 (existing Section 2D.49), WEIGH STATION Signing (D8 Series), FHWA proposes to add a Support paragraph that defines the areas where certain vehicles might be directed to stop to be weighed or inspected and that such an area can be permanent or a temporary mobile facility. FHWA adds this provision to give agencies more flexibility.

FHWA proposes to revise existing Standard P2, and reference the figure, to indicate the appropriate sequence of signs for Weigh Station signing on a conventional highway and revises the sign terminology to match the typical sequence of other types of guide signs. The resulting sign sequence includes Advance Weigh Station Distance, Weigh Station Next Right, and Weigh Station Exit Direction Signs. In concert with this change, FHWA proposes to add a Guidance statement recommending an Exit Gore sign with the same basic legend as the Weigh Station Exit Direction sign be used to emphasize the entrance to the weigh station. FHWA proposes these revisions to provide more clarity on Weigh Station signing.

FHWA also proposes to add an Option statement that allows the use of the alternate legend COMMERCIAL

VEHICLE INSPECTION AREA for the D8 series Weigh Station signs. FHWA proposes this revision to be consistent with the type of activity being conducted at the station.

FHWA also proposes to add a Standard statement indicating what when the WEIGH STATION legend of the D8 series signs is replaced with the COMMERCIAL VEHICLE INSPECTION AREA legend, the WEIGH STATION legend of the R13-1 sign shall be replaced with the alternate legend INSPECTION area. FHWA proposes this change for consistency in sign legends.

177. FHWA proposes to relocate and renumber existing Section 2D.54 as Section 2D.52 Crossover Signs (D13-1, D13-2). FHWA proposes to delete portions of existing Standard P2 and all of Standard P5 pertaining to the design of the Crossover and Advance Crossover signs because the language is unnecessary since the sign designs are standardized in accordance with the existing requirements in Chapter 2A.

178. In Section 2D.53 (existing Section 2D.51), retitled, “Truck and Passing Lane Signs (D17-1, D17-2, D17-3, and D17-4),” FHWA proposes to revise the existing Guidance statement to remove the word “NEXT” from a Truck Lane sign used immediately in advance of a truck lane in order to reserve the use of the word “NEXT” for areas where there is a series of extra lanes added along a highway for trucks to use, as proposed in the new Guidance statement. In concert with this change, FHWA proposes to recommend that the sign include a distance of ½ mile in the legend. As part of these changes, FHWA clarifies that a truck lane is a lane added to the right of the travel lane to be used by trucks and other slow-moving vehicles. This allows the faster vehicles to pass without leaving the travel lane.

FHWA also proposes to add Guidance statements describing the use of Passing Lane and Next Passing Lane signs in a similar manner as Truck Lane signs. As part of these changes, FHWA distinguishes that a passing lane is an added lane to the left of the travel lane to be used by vehicle passing those in the travel lane.

FHWA also proposes to delete the existing Option allowing alternate legends, because provisions for the use of Passing Lane signs are proposed in the new Guidance. In addition, because a climbing lane is simply another name for a truck lane, FHWA proposes to remove this option to improve on uniformity in signing.

FHWA also proposes a new Support statement to include a new figure that illustrates an example of signing for an intermittent passing lane. FHWA

proposes to add this information to provide practitioners with needed guidance on the use of these signs, and their respective locations.

179. In existing Section 2D.54, renumbered and retitled, “Section 2D.54 Emergency and Slow Vehicle Turn-Out Signs (D17-5 through D17-7),” FHWA proposes to add a Guidance paragraph regarding the recommended use of emergency turn-out advance and directional signs including placement location ranges consistent with advance guide sign placement and deceleration distance for lower speed maneuvers.

FHWA also proposes to add a new figure illustrating an example of signing for an emergency turn-out.

180. In Section 2D.55 (existing Section 2D.50) Community Wayfinding Signs, FHWA proposes to add a Guidance paragraph recommending the evaluation of the entire existing system of signs for serviceability and general conformance with the Manual when a community wayfinding guide sign system is being considered. FHWA proposes this new Guidance because the condition and serviceability of existing higher priority signs, such as regulatory, warning, and major Designation signs, should have priority over the installation of the new community wayfinding signs.

FHWA also proposes to change the existing Guidance statement regarding the shape of wayfinding guide signs to a Standard to eliminate conflict with overall sign shape requirements.

FHWA also proposes to add a Guidance statement regarding the letters, numerals, and other characters should be composed of the Standard Alphabets in accordance with the provisions of Chapter 2A to maintain consistency of signs.

FHWA also proposes to add a Standard paragraph requiring conventional lettering style, prohibiting the use of italic, oblique, script, highly decorative, or other unusual forms. FHWA proposes this new Standard to help identify letter style types that, by their nature, would not meet the letter style requirements provided in this section for maintaining adequate legibility under driving conditions.

FHWA also proposes to revise the Standard paragraph pertaining to internet and email addresses to be consistent with changes made to the same provision in Section 1D.09.

181. FHWA proposes to retitle Section 2D.56 (existing Section 2D.53), “Signing of Named Highways for Mapping and Address Purposes,” to clarify the intent of the section.

FHWA also proposes to add a Support paragraph to provide information that

distinguishes between highway names, which are used for navigation and mapping, and memorial, honorary, or secondary names, which are not considered to be highway names. This information is needed for agencies to understand the applicability of the Standard, Guidance, and Option statements in this section.

182. In Section 2D.57 (existing Section 2D.55), retitled, “National Scenic Byways Sign and Plaque (D6-4, D6-4aP),” FHWA proposes a new Support statement to indicate that direction along routes and to sites is related to touring maps rather than directional signing and route marking of the byway itself.

FHWA also proposes to add four Guidance paragraphs regarding the placement of signs displaying the name of the byway and associated byway Directional Assemblies. FHWA proposes these guidance statements to encourage uniformity and to separate Route Directional Assemblies from byway Directional Assemblies.

FHWA also proposes to add a Standard that prohibits the use of the Byway sign or plaque as part of a guide sign assembly, as these signs are intended only for use in independent Directional Assemblies. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement, consistent with the existing Standard requiring that other signs have primary visibility.

183. FHWA proposes to add a new section numbered and titled, “Section 2D.58 State-Designated Scenic Byway, Historic Trail, and Auto Tour Route Signs,” that contains relocated provisions from existing Section 2H.07, Auto Tour Routes, as well as new provisions for State scenic byway and historic trails. FHWA proposes this new Section to address inconsistencies in how these facilities are signed.

184. FHWA proposes to add a new section numbered and titled, “Section 2D.59 EMERGENCY ROUTE and EMERGENCY ROUTE TO Signs and Plaques” that contains provisions and accompanying figure for permanently signing emergency routes for the purposes of corridor management. FHWA proposes these changes based on Official Ruling No. 6(09)–42(I)³⁸ “Signing for Rerouting Due to Traffic Incidents.”

³⁸ FHWA’s Official Ruling No. 6(09)–42(I), April, 21, 2017, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/6_09_42.htm.

Discussion of Proposed Amendments to Chapter 2E Guide Signs-Freeways and Expressways

185. As part of the reorganization to improve usability of the MUTCD, FHWA proposes to include subchapter headings in Chapter 2E to organize sections into related groupings. FHWA proposes the following subchapters in Chapter 2E: General, Sign Design, Installation, Guide Signing for Interchanges, Other Guide Signs, Signs for Intersections at Grade, and Interface with Conventional Roadways.

186. In Section 2E.01 Scope of Freeway and Expressway Guide Sign Standards, FHWA proposes to add Support, Option, Guidance, and Standard statements regarding the application of design provisions for freeway and expressway guide signs in tunnels, which can present unique challenges not encountered elsewhere due to the extended and continuous distances of constrained vertical and horizontal clearances in which to place signs. FHWA proposes these new provisions to provide flexibility to standard sign layouts when needed to accommodate such situations in tunnels.

187. In Section 2E.06 (existing Section 2E.09) Signing of Named Highways, FHWA proposes to change P1 from Support to Guidance to recommend, not just state, that signing of named highways should comply with provisions of Section 2D.56. FHWA proposes this change to convey more effectively what was intended by the existing Support statement.

188. In Section 2E.07 (existing Section 2E.13) Designation of Destinations, FHWA proposes to add Support and Guidance statements, as well as a new figure, regarding signing for destinations that are accessed from different exits in opposing directions of travel. FHWA proposes these new provisions to provide clarity and flexibility regarding the appropriate signing for destinations based on the local roadway network.

189. In Section 2E.08 (existing Section 2E.04) General, FHWA proposes to delete the Standard statement regarding standard traffic sign shapes and colors because the provisions are already covered in Chapter 2A. FHWA proposes this change to remove unnecessary and repetitive content and streamline the Manual to improve its usability.

190. In Section 2E.12 (existing Section 2E.14) Size and Style of Letters and Signs, FHWA proposes to revise the Standard paragraph regarding the minimum numeral and letter sizes to be as shown in the "Overhead" columns of Tables 2E-2 and 2E-4. FHWA proposes

this change to clarify the application of the "Overhead" columns when a larger size is specified in the same tables based on interchange classification.

191. In Section 2E.14 (existing Section 2E.16) Sign Borders, FHWA proposes to relocate the Standard statement regarding the color of the sign border to Section 2A.14, because that section already contains information about sign borders, while maintaining the recommendations on border width, as that is commonly needed information for the larger size signs on these types of highways. FHWA proposes this change to remove unnecessary or repetitive content and streamline the Manual to improve its usability.

192. In Section 2E.15 (existing Section 2E.10), FHWA proposes to add a Support statement to describe the use of street names on Advance guide and Exit Direction signs, based on the number of interchanges that serve a community. FHWA proposes this new statement, including references to other sections with Chapter 2E, to provide users with additional information regarding proper and efficient community interchange signing.

193. In Section 2E.16 (existing Section 2E.17) Abbreviations, FHWA proposes to delete the Guidance and Standard paragraphs and replace them with a new Standard that requires abbreviations on freeway and expressway guide signs to comply with Section 2D.07. FHWA proposes this change to remove repetitive content and streamline the Manual to improve its usability.

194. In Section 2E.17 (existing Section 2E.18) Symbols, FHWA proposes to delete the Standard paragraph regarding symbol designs because it duplicates language in Section 2A.12.

FHWA also proposes to delete the Option statement permitting the use of educational plaques below symbol signs where needed. FHWA proposes this change because symbols, if used on freeway or expressway signs, are incorporated into the legend of the sign, and the addition of an educational plaque could distort and overly complicate the intended message.

195. In Section 2E.18 (existing Section 2E.19) Arrows for Interchange Guide Signs, FHWA proposes several editorial changes to attain consistency in the placement of arrows on Exit Direction guide signs, depending on their placement either overhead or post-mounted, and position over the exit lane. FHWA also proposes a new figure to illustrate the provisions.

196. In Section 2E.20 (existing Section 2E.26) Lateral Offset, FHWA proposes to add an exception to permit a narrower lateral offset for sign supports when

shielded by a rigid barrier. FHWA proposes this change to provide greater design flexibility for agencies.

197. In Section 2E.21 (existing Section 2E.30) Interchange Guide Signs, FHWA proposes to change P3 from Guidance to Support, to provide references to applicable provisions related to sign descriptions and the order in which they appear at the approach to and beyond an interchange. FHWA makes this change because the provisions for each are contained in the individual sections.

FHWA also proposes to revise the wording of P4 to clarify the intent that the use of Supplemental Guide signing should be minimized.

198. In Section 2E.22 (existing Section 2E.31) Interchange Exit Numbering, FHWA proposes to provide specific requirements for exit number suffix assignments and order based on direction of travel and interchange numbering, while deleting a size requirement for the Exit Number plaque that is standardized in existing Table 2E-1. FHWA proposes this change to improve interchange exit numbering consistency in response to driver expectancy, and to reduce unnecessary duplication of information.

FHWA also proposes to change the existing Guidance statement regarding exit number plaques for right-side exits to a Standard for consistency in placement of exit number plaques and consistency with similar provisions for left-side exits.

199. In Section 2E.23 (existing Section 2E.33) retitled, "Advance Guide Signs (E1 Series)," FHWA proposes to add a new Standard requiring at least one Advance guide sign for all interchange classifications with two exceptions. FHWA proposes this change to clarify the intent of existing language, which confounds the criteria for locating the sign with the criteria for when to use the sign. FHWA believes it is important to provide at least one guide sign in advance of a freeway or expressway interchange because advance notice of exits provides road users the time necessary to change lanes to position themselves to take an exit safely, avoiding last-minute weaving conflicts and erratic maneuvers. This requirement has been implicit in subsequent sections but not as clearly stated for Advance guide signs as it is for Exit Direction signs.

FHWA proposes to modify P4 to recommend displaying distances to the nearest 100 feet on Advance guide signs less than ¼ mile from the exit. FHWA also proposes to change the last sentence from Guidance to Standard requiring, instead of recommending,

that fractions of a mile be displayed rather than decimals, for all cases to aid in quick recognition of the sign message. FHWA proposes this change to eliminate conflicts with other provisions of the Manual.

In addition, FHWA proposes to add a new Standard requiring that an Exit Number (E1–5P through E1–5eP) plaque be positioned at the top right-hand edge of the sign for numbered exits to the right. FHWA proposes this change clarifying the position of the plaque for consistency with similar provisions for Exit Direction signs.

FHWA also proposes to change P10 regarding omitting the word EXIT(S) from the distance message where interchange numbering is used from Guidance to Standard and incorporate the provision into P9. FHWA proposes this change for consistency in sign legend and to reduce unnecessary legend on signs.

FHWA proposes to revise the paragraph regarding the use of Interchange Sequence signs, clarifying that the recommended distance of 800 feet is between the theoretical gores of successive interchange entrance and exit ramps. FHWA proposes this change because the existing language is ambiguous and can imply that the distance is between the interchange crossroads, which is not relevant to the locations of ramps between which signs can be located.

Lastly, FHWA proposes to delete the Option statement allowing the W16–16P plaque to be installed below the Advance guide sign. FHWA proposes this change because the current language does not promote uniformity. The provision for locating the W16–16P at the top of sign is Guidance, which provides sufficient flexibility for an agency to decide differently based on engineering factors when necessary. FHWA believes that the presence of an Exit Number plaque is not sufficient justification for a categorical Option.

200. In Section 2E.24 (existing Section 2E.40) retitled, “Interchange Sequence Signs (E9–1 Series, E9–2 Series),” FHWA proposes to change the existing Option statement regarding signing for closely spaced interchanges to a Support to be consistent with the language provided in existing Sections 2E.33 and 2E.50.

FHWA also proposes to switch the order of existing Guidance P3 and P2 and revise the language to match that of Section 2E.23 Advance Guide Signs with respect to the use of Interchange Sequence signs where there is less than 800 feet between the theoretical gores of successive interchange entrance or exit ramps.

FHWA also proposes to change P5 from Support to Standard to describe the proper use of Interchange Sequence signs and require the display of the next two or three interchanges by name or route number with distances to the nearest ¼ mile. FHWA proposes this change because, by definition, these signs are intended for use in a series and to provide consistency in the signing for the sequence of the closely spaced interchanges.

201. In Section 2E.25 (existing Section 2E.36) retitled, “Exit Direction Signs (E4 Series),” FHWA proposes to change the existing Guidance statement regarding placement of the exit number plaque on signs for numbered exits to the right to a Standard. FHWA proposes this change to provide consistent placement of exit number plaques for numbered exits to the left and right. This proposed change is a companion to the existing requirement that exit number plaques for numbered exits to the left are required to be on the left-hand edge of the sign, thereby meeting driver expectation in similar situations.

FHWA also proposes to change P14 from an Option to Guidance to recommend, instead of allowing, the overhead Exit Direction sign for the second exit to be placed either on the overcrossing structure or on a separate structure immediately in front of the overcrossing structure. FHWA proposes this change for consistency with signing provisions for cloverleaf interchanges and to clarify the fact that overhead mounting is recommended in this situation.

In addition, FHWA proposes to add a new Option allowing the use of warning beacons with the E13–2 sign panel. In concert with this change, FHWA also proposes to add a Standard requiring the warning beacons to be placed at least 12 inches from the edges of the E13–2 sign panel, from the edge of the sign, and from any other legend within the guide sign, to provide adequate space around the beacons to reduce glare that can adversely impact the legibility of the sign legend, consistent with existing provisions in Chapter 4L of the MUTCD.³⁹ FHWA proposes these changes because the use of warning beacons is implied by Figure 2E–7 (existing Figure 2E–31), but no provisions previously existed in Chapter 2E that would allow the beacons within the sign face.

Similar to the change discussed in the previous item, FHWA proposes to delete

the Option statement regarding the placement of the W16–16P plaque because it does not promote uniformity.

202. In Section 2E.26 (existing Section 2E.37) retitled, “Exit Gore Signs and Plaque (E5–1 Series),” FHWA proposes to clarify that Exit Gore signs are required for each ramp that departs from the main roadway of a freeway or expressway.

FHWA also proposes to modify P5 to specify a height of 4 feet above the ground line for installing the optional Type 1 object markers on supports to Exit Gore signs.

203. In Section 2E.27 (existing Section 2E.12) retitled, “Pull-Through Signs (E6–1 Series and E6–2 Series),” FHWA proposes to revise the Guidance statement to indicate that Pull-Through signs should not be used at exits that are signed with Overhead Arrow-Per-Lane or Diagrammatic guide signs. FHWA proposes to add this exception because signing for option lanes is unique, and because either the Overhead Arrow-per-Lane or Diagrammatic guide sign designs are required to be used for all freeway and expressway splits that include an option lane, and both of those sign designs already provide the through roadway direction guidance to road users.

204. In Section 2E.28 (existing Section 2E.24) Signing for Interchange Lane Drops, FHWA proposes to add an Option statement allowing the exit arrow to be positioned to the left or right of the words “EXIT ONLY” when the position of the sign panel is constrained. FHWA proposes this change to provide agencies flexibility in sign design where needed due to size constraints.

FHWA also proposes to modify Standard P6 to clarify that in retrofit situations where the E11–1a and E11–1b sign panels are used, the references to the white down arrow apply to Advance guide signs. FHWA also proposes to add a provision regarding placement of the E11–1a and E11–1b sign panels when used on Exit Direction signs. Similarly, FHWA proposes to clarify that the position specified for the E11–1c sign panel requirement for retrofit situations applies to Advance guide signs.

FHWA proposes to add a new Guidance provision to accommodate lane drop situations where it is impossible to locate an Advance guide sign either overhead or above the dropped lane for the down arrow to point to the dropped lane. This provision is intended to be used sparingly and only in limited situations. To compensate for this otherwise inconsistent condition, the addition of a post-mounted warning sign is recommended.

³⁹ Information on the concept of irradiation and disability glare can be viewed at the following internet website: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1444-0938.2003.tb03080.x>.

Lastly, FHWA proposes to add a Guidance statement, and accompanying example figure, recommending the use of overhead and/or post-mounted warning signs where a mainline lane is dropped immediately after an exit ramp. FHWA proposes this recommendation to provide additional warning to road users of a lane drop.

205. In Section 2E.29 (existing Section 2E.43) Signing by Type of Interchange, FHWA proposes to delete the Standard that requires interchange guide signing to be consistent for each type of interchange along a route, because there are instances where the signing for similar interchanges along a route would need to vary due to interchange spacing and other geometric features. In concert with this change, FHWA proposes to revise the Guidance to recommend that the signing layout be similar for interchanges of the same type.

FHWA also proposes to add a new Guidance provision recommending that the main roadway major guide signing should be determined by the specific interchange type for that particular direction of travel where a single interchange combines a different type of ramp configuration for each direction of travel.

FHWA proposes to add two figures to this section to provide practitioners with examples for interchange signing. Figure 2E-15 shows an example of signing for a complex interchange that combines intermediate interchange ramps within a major interchange, and Figure 2E-16 shows an example of signing for an interchange exit ramp with a downstream split.

206. In Section 2E.31 (existing Section 2E.48) Diamond Interchange, FHWA proposes to delete P2 regarding the EXIT message because the requirements are redundant with Section 2E.22 (existing Section 2E.31) and Section 2E.23 (existing Section 2E.33).

FHWA also proposes to delete P5 Option regarding the use of Advisory Exit Speed signs based on an engineering study, and revise to refer instead to the provisions contained in Chapter 2C that cover the Advisory Exit Speed signs to determine when they are necessary. FHWA proposes this change to remove redundant and potentially conflicting information, thus streamlining the Manual and improving its ease of use.

Lastly, FHWA proposes a new Guidance provision to recommend that a Destination guide sign be placed along the ramp where traffic is allowed to turn in either direction onto the crossroad. FHWA proposes this provision, which reflects common practice, to

accommodate the road user's expectancy of positive, continuous guidance in signing to a destination that is displayed on the highway on an approach to an interchange.

207. In Section 2E.32 (existing Section 2E.49) Diamond Interchange in Urban Area, FHWA proposes to revise the existing Option provision regarding closely spaced interchanges to clarify that the distances under consideration are those specified in another Section of Chapter 2E. FHWA proposes this change to improve the usability of the Manual.

208. In Section 2E.33 (existing Section 2E.45) Cloverleaf Interchange, FHWA proposes to revise the Standard statement to remove redundant information contained in Section 2E.23 (existing Section 2E.33) and Section 2E.26 (existing Section 2E.37).

209. In Section 2E.34 (existing Section 2E.46) Cloverleaf Interchange with Collector-Distributor Roadways, FHWA proposes to revise the existing Option provision regarding exit numbering to Guidance. FHWA proposes this change to accommodate driver expectancy by more consistently numbering these types of interchanges and more readily facilitate navigation, in concert with other changes in this Chapter to make exit numbering more consistent. FHWA believes that Guidance should still provide sufficient discretion to States in those limited situations where conditions might warrant.

210. In Section 2E.35 (existing Section 2E.47) Partial Cloverleaf Interchange, FHWA proposes to delete P3 regarding post-mounted Exit Gore signs because the requirement is redundant with Section 2E.26 (existing Section 2E.37).

211. FHWA proposes to add a new section numbered and titled, "Section 2E.36 Collector-Distributor Roadways for Successive Interchanges," with Support and Guidance statements, along with a new Figure 2E-21, describing signing for collector-distributor roadways that provide access to multiple interchanges. FHWA proposes this new section to assist agencies with signing these configurations.

212. In Section 2E.37 (existing Section 2E.44) Freeway-to-Freeway Interchange, FHWA proposes to change the existing Standard paragraph regarding splits where the off-route movements to the left to a Support statement to refer users to Section 2E.23 for the use of the Left Exit Number plaque. Similarly, FHWA proposes to add a reference to Section 2E.39 and Section 2E.40 for use of Overhead Arrow-per-lane or Diagrammatic guide signs for freeway splits with an option lane and for multi-lane freeway-to-freeway exits having an option lane.

FHWA also proposes to add a Standard requiring the signing for the roadway for the off-route to be signed as an exit from the main route, requiring that signs comply with Section 2E.22 to provide continuity in exit numbering along the route, and that the distance messages on the Advance guide signs comply with Section 2E.23. FHWA proposes this change for signing consistency and continuity in navigational guidance, which reduces potential confusion to road users, thus improving operation and safety.

FHWA proposes to delete the Option regarding the omission of the control city on Pull-Through signs because there is no requirement to display the control city on a Pull-Through sign.

FHWA proposes to change P8 from an Option to a Guidance statement to recommend that the Advisory Exit Speed (W13-2) be used where an engineering study shows that it is necessary. FHWA proposes this change to be consistent with the same change in Section 2E.31 (existing Section 2E.48).

Finally, FHWA proposes to delete the Option regarding extra emphasis of an especially low advisory ramp speed because it is redundant with Section 2E.25 (existing Section 2E.36).

213. FHWA proposes to add a section numbered and titled, "Section 2E.38 Freeway Split with Dedicated Lanes," to provide Standard and Guidance paragraphs regarding freeway splits with dedicated lanes to accompany Figure 2E-24 (existing Figure 2E-34). FHWA proposes this new section to provide important information about guide signing for freeway splits with dedicated lanes that was previously implied by existing 2E.14, but not described in the text.

214. In Section 2E.40 (existing Section 2E.21) Design of Overhead Arrow-per-Lane Guide Signs for Option Lanes, FHWA revises P2 to clarify the requirement to use Overhead Arrow-per-Lane guide signs at "reconstructed" locations on freeways and expressways. In accordance with Official Ruling No. 2(09)-5(I),⁴⁰ a "reconstructed" location is defined as one where the replacement of an existing sign support structure is necessitated by reconstruction.

FHWA proposes to add an Option statement and accompanying figure permitting signs indicating destinations to be added along unusually long gore areas with narrow lane marking tapers. FHWA proposes this to allow agencies

⁴⁰ FHWA's Official Ruling No. 2(09)-5(I), October 22, 2010, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/2_09_5.htm.

to add these signs to reinforce positive guidance.

FHWA also proposes to add an Option permitting the use of warning beacons with the E13-2 sign panel when used on an Overhead Arrow-per-Lane guide sign, consistent with similar changes proposed for Exit Direction signs.

215. In Section 2E.41 (existing Section 2E.22) Design of Freeway and Expressway Diagrammatic Guide Signs for Option Lanes, FHWA proposes to add a Standard statement clarifying that it is not allowed to use a diagrammatic guide sign on the mainline to depict a downstream split of an exit ramp. FHWA proposes this change to clarify the existing provisions, which allow only the depiction of the simplified geometric configuration at the exit departure, but not beyond the bifurcation, to avoid an undue informational load imposed on road users. FHWA proposes to include this clarification to address situations that have been observed in practice.

FHWA also proposes to add an Option permitting the use of warning beacons with the E13-2 sign panel when used on a Diagrammatic guide sign, consistent with similar changes proposed for Exit Direction signs.

As an alternative to these changes, FHWA proposes to delete in its entirety Section 2E.41 and the concept of Freeway and Expressway diagrammatic guide signs for option lanes. FHWA offers this alternative proposal because most States have now had experience implementing overhead arrow-per-lane signs, which have been shown to be superior to diagrammatic signs at option lanes, especially for older road users; and because FHWA also proposes the Partial-Width Overhead Arrow-per-Lane sign (Section 2E.42), which would allay concerns expressed in response to the NPA for the 2009 MUTCD regarding excessive sign sizes or costs at non-major interchange exits with an option lane. This alternative proposal would retain the diagrammatic sign concept for conventional roads and for circular roads to show general or relative direction, but not lane use indicated by lane lines within the diagrammatic arrow, as diagrammatic signs have been shown to be ineffective for that purpose. FHWA seeks comment from the public on this alternative proposal, including the technical merits, advantages and disadvantages, and comparative cost information.

216. In Section 2E.42 (existing Section 2E.23) Signing for Intermediate and Minor Interchange Multi-Lane Exits with an Option Lane, FHWA proposes to add a Guidance statement as well as

revise existing Guidance statements recommending the use of a modified form of the Overhead Arrow-per-Lane guide signs at exit locations with an option lane that also carries the through route. FHWA also proposes to add figures to provide examples. FHWA proposes these revisions to provide practitioners with provisions to sign this type of exit, which can often be confusing to road users, in a uniform, consistent manner.

217. In Section 2E.45 (existing Section 2E.34), retitled, "Next Exit Plaques (E2-1P, E2-1aP)," FHWA proposes to delete the Option statement regarding the Next Exit plaque with one or two lines because the designs are standardized. In addition, FHWA proposes to incorporate the Support information regarding the desirable use of the Next Exit plaque designs into a Guidance statement because the language establishes a preferred practice.

218. FHWA proposes to add a section numbered and titled, "Section 2E.48 Post-Interchange Travel Time Sign (E7-4 Series)" with Support and Standard paragraphs regarding a new Post-Interchange Travel Time Sign. FHWA proposes this new sign series because at certain locations on freeways and expressways it may be more meaningful to road users to display the travel time rather than the distance to a destination, and to standardize the sign designs to ensure that an undue informational load is not imposed on the road user.

219. FHWA proposes to add a section numbered and titled, "Section 2E.49 Distance and Travel Time Sign and Comparative Travel Time Sign (E7-5, E7-6)" with Support, Standard, and Guidance paragraphs regarding the new Distance and Travel Time Sign (E7-5) and the Comparative Travel Time Sign (E7-6). FHWA proposes these new signs because some locations on freeways and expressways might benefit from a travel time message displayed with the distance or comparative travel times for alternative routes to a common destination, and to standardize the sign designs to ensure that an undue informational load is not imposed on the road user.

220. In Section 2E.50 (existing Section 2E.35), retitled, "Supplemental Guide Signs (E3 Series)," FHWA proposes to add a new Guidance paragraph recommending limiting Supplemental guide signs to situations where there is a demonstrated need to sign for more than two primary destinations from an interchange. FHWA proposes this change because, consistent with the established guidelines for the use of Supplemental guide signs, most interchanges would not have a need for

Supplemental guide signs, and it is important to limit amount of information provided to drivers to that which is necessary for basic navigational purposes.

FHWA also proposes to relocate and revise existing Guidance P5 to earlier in the section, recommending that Supplemental guide signs should not be used unless the destination meets the criteria established by the State or agency policy. FHWA proposes this addition because use of a policy is important to establishing and retaining signing consistency and signing is for justified destination only.

FHWA proposes to revise existing Guidance to limit the number of lines of destination information to no more than three, retaining the limit of the number of destinations to two, consistent with other destination guide signs.

FHWA proposes to add a new Guidance recommending that a Supplemental guide sign not be installed in the same location with or where it would detract from guide signs for a different interchange.

FHWA proposes to add a Standard that prohibits signing more than four supplemental traffic generator destinations from a single interchange along the main roadway, consistent with the limitation on the number of Supplemental guide signs and the number of destinations allowed on each sign allowed at each interchange.

FHWA proposes to add a Standard that prohibits the installation of supplemental guide signs at the same location as Advance guide, Exit Direction, or other signs related to the exit. FHWA adds this Standard because the function of a Supplemental guide sign is to supplement the major guide signs at a separate location with non-primary destination information so as not to increase the informational load displayed on the Advance guide and Exit Direction signs.

FHWA also proposes to add a Standard that classifies guide signs for recreational or cultural interest destinations as Supplemental guide signs, except where the interchange provides direct access to such a destination and is therefore displayed on the Advance guide and Exit Direction signs.

Finally, FHWA proposes several changes near the end of the section to reflect the results of a human factors evaluation of pictographs⁴¹ that revealed that pictographs are not effective, resulting in longer or additional glances, or both, toward

⁴¹ "Sports Logo Evaluation Report," Perez, W. *et al.*, November 2011.

Guide signs on which they are used, and the subsequent termination of Official Ruling No. 2–650(E).⁴² FHWA proposes to delete the Option statement allowing pictographs on a Supplemental guide sign and add a Standard statement that prohibits the use of pictographs on supplemental guide signs, except for transit system pictographs on the Park—Ride supplemental guide sign, and add a Guidance statement regarding the use and size of transit pictograph and the carpool symbol on the Park-Ride Supplemental guide sign. Finally, FHWA proposes to delete existing Standards P8, P10, and P11 regarding the use of pictographs as general conditions on the use of pictographs would be addressed in Chapter 2A. Since there would be no provision explicitly allowing use of a pictograph, such use, therefore, would be prohibited.

221. In Section 2E.51 (existing Section 2E.41) retitled, “Community Interchanges Identification Signs (E9–4 Series, E9–5 Series),” FHWA proposes to add a Guidance statement recommending that the legend displayed on the Advance Guide and Exit Direction signs for each interchange should be consistent with the interchange names displayed on the Community Interchanges Identification sign, and that the name of the community should not be repeated on the Advance guide and Exit Direction signs. FHWA proposes this new Guidance to maintain uniformity in signing for Community Interchanges.

222. In Section 2E.52 (existing Section 2E.42), retitled, “NEXT XX EXITS Sign (E9–3 Series),” FHWA proposes to add a Guidance statement recommending that the legend displayed on the Advance Guide and Exit Direction signs for each interchange should not display the region or area name that is displayed on the NEXT XX Exits sign. FHWA proposes this new Guidance to maintain uniformity in this type of signing and to reduce the informational load within a guide sign sequence.

223. In Section 2E.53 (existing Section 2E.54) Weigh Station Signing, FHWA proposes to add Support, Standard, Option and Guidance statements, as well as a new figure, to provide provisions for the standard sign sequence for a Weigh Station on an expressway or freeway to align better with typical signing conventions used on these types of roadways and to provide flexibility in the legend to allow an alternate message COMMERCIAL VEHICLE INSPECTION AREA, where

appropriate. These changes are in concert with proposed changes in Chapter 2D. As part of these changes, FHWA proposes to delete the existing Standard statement, since the proposed new text replaces the existing standard.

224. In Section 2E.54 (existing Section 2E.27) Route Signs and Trailblazer Assemblies, FHWA proposes to delete the Standard statement regarding the color of the route sign shield for the Interstate Highway System sign, as the design is standardized and must comply with the existing provisions of Chapter 2A.

225. In Section 2E.55 (existing Section 2E.28) Eisenhower Interstate System Signs (M1–10, M1–10a), FHWA proposes to incorporate the existing Guidance into the Standard that follows. This change is consistent with the intent of the design of the M1–10a sign, which uses a letter style designed for facilities that are not part of an Interstate main roadway or ramps. FHWA believes the M1–10 sign provides sufficient opportunity for agencies to sign Interstates and agencies may use this sign in place of the M1–10a sign if they wish to have a single standard, as the M1–10a sign is not required to be used.

226. FHWA proposes a new section numbered and titled, “Section 2E.56 Signs for Route Diversion by Vehicle Class” that includes Support, Guidance, and Option statements and an associated figure showing an example of signing for a route diversion based on vehicle class. FHWA proposes these provisions to create a more uniform approach to diversion signing based on vehicle class.

227. In Section 2E.57 (existing Section 2E.29) Signs for Intersections at Grade, FHWA proposes to replace the existing Option with a paragraph allowing exit numbering to be maintained when a freeway or expressway route is interrupted by a short segment of at-grade intersections. FHWA proposes this change because the existing Option is inconsistent with grade-separated roadway signing principles and the new Option allows continuity in navigation and signing along the length of an otherwise grade-separated route.

Discussion of Proposed Amendments to Chapter 2F Toll Road Signs

228. As part of the reorganization to improve usability of the MUTCD, FHWA proposes to include subchapter headings in Chapter 2F to organize sections into related groupings. FHWA proposes the following subchapters in Chapter 2F: General, Regulatory Signs, Warning Signs, and Guide Signs. FHWA proposes to include a list at the

beginning of the section to assist users in finding the appropriate sections.

229. In Section 2F.02, FHWA proposes to retitle the section “Sizes of Toll Road Signs and Electronic Toll Collection (ETC) System Pictographs” to reflect the proposed relocation of material from existing Section 2F.04 to this section.

230. In Section 2F.03, FHWA proposes to retitle the section, “Color” to reflect the content of the section more accurately.

231. In Section 2F.04 (existing Section 2F.05) Regulatory Signs for Toll Plazas, FHWA proposes to change Option P8 pertaining to speed limit sign placement at toll plazas to Guidance to describe the intent of the provision better.

232. In Section 2F.05 (existing Section 2F.12) retitled, “Electronic Toll Collection (ETC) Account-Only Regulatory Sign and Plaque (R3–31, R3–32P),” FHWA proposes to change the ETC Account-Only and NO CASH sign designations from auxiliary to regulatory sign and plaque for consistency with a similar change to toll auxiliary signs.

233. In Sections 2F.06 through 2F.09, FHWA proposes to add the Take Ticket (W9–6e) Advance Warning sign, Take Ticket (W9–6bP, W9–6gP) advance warning plaque, Stop Ahead Take Ticket (W9–6f) warning sign, and Stop Ahead Take Ticket (W9–6hP) warning plaque, respectively. FHWA proposes these new signs and plaques to provide practitioners with a standard sign for use on those facilities where tickets are issued to determine the length of travel for assessing toll fees.

In Sections 2F.06 through 2F.09, FHWA also proposes to delete the last sentence of the Standard requiring that the legend PAY TOLL shall be replaced with a suitable legend such as TAKE TICKET where road users entering a toll ticket facility are issued a toll ticket.

In Sections 2F.06 through 2F.08, FHWA also proposes to add Guidance that a Take Ticket Advance Warning sign should be installed overhead at approximately 1 mile and ½ mile in advance of mainline toll plazas to provide sufficient advance warning to road users of this required action.

234. In Section 2F.10 retitled, “LAST EXIT BEFORE TOLL Warning Plaques (W16–16P, W16–16aP),” FHWA proposes to add a new W16–16aP plaque as a two-line alternative to the W16–16P plaque. FHWA proposes this change to provide agencies design flexibility where the plaque is used above a narrow-width guide sign.

FHWA also proposes to require the Exit Number Plaque, if used, to be installed above the LAST EXIT BEFORE

⁴² FHWA Official Ruling No. 2–650(E), “Sports Team Logos on Guide Signs.”

TOLL plaque for numbered exits. FHWA proposes this change to reiterate and clarify the existing requirements in Chapter 2E for the position of the Exit Number plaque. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement.

FHWA proposes to delete the Standard, since the design of the W16–16P is standardized and compliance is required in accordance with the existing provisions of Chapter 2A.

235. In Section 2F.11 retitled, “TOLL Warning Plaque (W16–17P),” FHWA proposes to change the TOLL auxiliary sign from the Marker series (M4–15) to a warning plaque and change the designation of the sign accordingly. FHWA proposes this change because the yellow background with black legend “TOLL” is used to call drivers’ attention to the tolled condition of a highway or highway segment to which they are being guided and is not consistently used in the same manner as an auxiliary sign.

236. In Section 2F.12 (existing Section 2F.13) Toll Facility and Toll Plaza Guide Signs—General, FHWA proposes to add an Option to allow a State Toll Route system sign to be used in lieu of the State Route sign in combination with the TOLL warning plaque. FHWA proposes this change to allow those States that have developed a unique Route Sign design for tolled State highways to continue to use those types of signs whose designs conform to the prescribed criteria, rather than requiring a separate auxiliary sign.

FHWA also proposes to add a Standard statement requiring State Toll Route signs to incorporate the word TOLL into its design using the same letter height, legend, background colors, and overall plaque dimensions specified for the W16–20P plaque. FHWA proposes this change to maintain uniform legibility criteria for either method.

In addition, FHWA proposes to supplement an existing Standard statement prohibiting the modification of Interstate, Off-Interstate, and U.S. Route signs for tolled facilities. FHWA proposes this change to maintain uniformity of these signs because they apply to national systems. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement, as modification of these signs has never been allowed.

FHWA also proposes to modify existing Standard P20 to require, rather than allow as an Option, the incorporation of the Toll Taker (M4–17) symbol panel in signs for attended lanes

at toll plazas. In concert with this change, FHWA also proposes changing the Standard for word messages such as FULL SERVICE, CASH, CHANGE, or RECEIPTS to an Option to supplement the required symbol panel. FHWA proposes this change to standardize and use symbols in place of word messages where a symbol has been developed that provides at least equivalent levels of comprehension, legibility, and recognition, based on relevant research.⁴³

Lastly, FHWA proposes to add a Standard statement requiring the use of an Overhead-Arrow-Per-Lane Guide sign in advance of a location where the mainline lanes split to separate traffic entering Open-Road ETC lanes from lanes entering a toll plaza where other methods of payment are accepted and an option lane is provided at the split. FHWA proposes this standard to be consistent with the use of Overhead-Arrow-Per Lane Guide signs in Chapter 2E where there is a split in the highway with an option lane.

237. FHWA proposes to add a new section numbered and titled, “Section 2F.13 Electronic Toll Collection (ETC) Signs—General,” that contains information from paragraphs 9 through paragraph 17 of existing Section 2F.13.

FHWA also proposes to relocate the existing Option statement regarding the use of a toll highway by non-registered toll account program drivers to new Section 2F.18.

238. In Section 2F.17 Guide Signs for Entrances to ETC Account-Only Facilities, FHWA proposes to relocate and modify an Option statement from existing Section 2F.18 to permit a separate information sign displaying the route number, TOLL warning panel, and the legend NO CASH within the sequence of the advance guide signs on the approach to the entrance to an ETC Account-Only facility, which is already depicted in existing Figure 2F–6. FHWA proposes this change to provide agencies flexibility to use additional advance signing if needed.

FHWA also proposes an Option to allow the Exit Gore signs for entrance ramps to ETC Account-Only facilities to incorporate the pictograph of the ETC payment system with the word ONLY in the header panel or plaque. FHWA proposes this change to allow agencies to reinforce that an ETC account is required to use the facility.

239. FHWA proposes to add two new sections numbered and titled, “Section

2F.18 Guide Signs for Entrances to ETC-Only Facilities” and “Section 2F.19 Guide Signs for ETC-Only Entrance Ramps to Non-Toll Highway” that contain provisions related to guide signs on facilities that are electronically tolled but do not require an ETC account. FHWA proposes to add these sections because of the increasing use of ETC-Only facilities. The proposed new provisions are intended to provide consistent and uniform signing, much of which is already depicted in existing figures within this Chapter.

240. In proposed new Section 2F.18, FHWA proposes to include a new Standard regarding signs used to identify ETC-Only facilities that collect tolls by post-travel billing of registered vehicle owners through postal mail, including if an ETC account program registration is also accepted. In concert with this change, FHWA proposes to add an Option allowing the addition of a plaque with the legend NO CASH on these signs.

FHWA also proposes to include an Option statement providing flexibility to display pictographs for other accepted ETC toll programs on separate information signs if the post-travel billing program also allows payment through those ETC accounts without restriction in the agencies’ primary ETC program.

FHWA also proposes to add an Option statement for flexibility regarding signs that may be used to let motorist know if a surcharge is added to the toll amount for those not registered in toll account program.

241. In proposed new Section 2F.19, FHWA proposes to add Standard statement requiring guide signs for these ramps to comply with the provisions of 2F.18 to ensure consistency in signing between toll facilities and ramps.

FHWA also proposes to add an Option statement allowing a NO–TOLL panel to be included on the top of the Exit Gore sign for an exit that provides access to the facility without charging a toll to provide clarification to the drivers.

Discussion of Proposed Amendments to Chapter 2G Preferential and Managed Lane Signs

242. In Section 2G.01 Scope, FHWA proposes to add a new Standard statement excluding bike lanes from the provisions of the Chapter unless otherwise provided. FHWA proposes this change because, in general, information specific to bike lanes is included in Part 9.

243. In Section 2G.03 Regulatory Signs for Preferential Lanes—General, FHWA proposes to revise Option P14 to

⁴³ Traffic Control Devices Pooled Fund Study: Comprehension and Legibility of Selected Symbol Signs, Phase III, dated June 2012 is available at the following internet website: <https://www.pooledfund.org/details/study/281>.

increase the minimum vertical clearance from 14 feet to 17 feet for post-mounted preferential lane regulatory signs on a median barrier where lateral clearance is limited. FHWA proposes this change for consistency with Standard P15 which references a requirement in Section 2A.18 to provide a 17-foot minimum vertical clearance for overhead signs that are over the lane or shoulder. FHWA proposes similar changes in 2G.08, "Warning Signs on Median Barriers for Preferential Lanes," and Section 2G.10, "Preferential Lane Guide Signs—General."

FHWA also proposes to delete Option P19 and Standard P20 allowing the HOV abbreviation or the diamond symbol on signs because all the standard signs for HOV lanes include the diamond symbol and therefore the option is not needed.

Lastly, FHWA proposes to relocate paragraphs 23 through 26 from Section 2G.03 to Section 2G.16.

244. In Section 2G.04 retitled, "Vehicle Occupancy Definition Signs (R3–10 Series and R3–13 Series)," FHWA proposes to remove Guidance paragraphs 4 and 5, because the legend format of these signs is standardized and must comply with existing requirements of Chapter 2A.

FHWA also proposes to change the Standards in paragraphs 9 and 10 and add an Option to allow, rather than require, the placement interval of 1/2 mile for R3–11a and R3–10 signs along the length of an HOV lane where access is denied, to provide agencies greater flexibility.

Finally, FHWA proposes to revise the last Guidance statement to specify that the Preferential Lane regulatory sign sequence spacing of 800 to 1,000 feet is applicable to freeways and expressways and proposes to recommend that sign spacing on conventional roads should be determined by engineering judgment based on speed, block length, distances from adjacent intersections, and other site-specific considerations. FHWA proposes these changes due to the differences in types and speeds of conventional roads and the need to provide agencies with more flexibility to provide appropriate signing based on site-specific conditions.

245. In Section 2G.05 retitled, "Preferential Lane Operation Signs (R3–11 Series, R3–14 Series)," FHWA proposes to change the Guidance statement regarding the size of post-mounted R3–11 series signs to a Support statement to describe why the sizes are standardized.

FHWA also proposes to add a Guidance statement regarding increasing the height of the R3–11 series

signs for locations where regulations are in place more than one time period of the day to accommodate additional lines of legend.

In addition, FHWA proposes to change the requirement to show 24 HOURS when a preferential lane restriction is in effect on a full-time basis to an Option. FHWA proposes this change because typically traffic regulations are assumed to be in effect on a full-time basis. However, FHWA retains the option to use the 24 HOURS legend because there are situations where it is necessary to reinforce that a restriction is in place at all times as part of a change in operation or where several facilities in the same area have different hours of operation.

FHWA proposes to add a new Option statement that allows the use of posted mounted Periods of Operation (R3–11 series) signs instead of overhead Periods of Operation (R3–14 series) signs on conventional roads with preferential lane operations. FHWA proposes this option to provide clarity to an existing provision.

FHWA proposes to delete existing Guidance P13 recommending the use of overhead or post-mounted Period of Operations signs at periodic intervals along the length of a contiguous or buffer-separated preferential lane where continuous access with the adjacent general-purpose lanes is provided, because the use of these signs is required a Section 2G.05 Standard.

Finally, FHWA proposes to delete existing Option P15 regarding the use of overhead Periods of Operation (R3–14 series) signs at the beginning or entry points and/or at intermediate points along preferential lanes on conventional roads, because stating this as an Option is unnecessary.

246. In Section 2G.07 retitled, "Preferential Lane Ends Signs (R3–12a, R3–12b, R3–12c, R3–12d, R3–12g, R3–12h, R3–15b, R3–15c, R3–15e)," FHWA proposes to specify that the requirements for installing a Preferential Lane Ends sign 1/2 mile in advance of the termination of the lane or where it becomes a general-purpose lane apply specifically to freeways and expressways. FHWA also proposes to add a new Guidance statement to determine the location of the Preferential Lane Ends sign on conventional roads based on engineering judgment. FHWA proposes these changes due to the differences in types and speeds of conventional roads and to provide agencies with more flexibility to provide appropriate signing based on site-specific conditions.

247. In Section 2G.11 retitled, "Signing for Initial Entry Points to Preferential Lanes," FHWA proposes to add a new Standard to require an Advance Guide sign approximately 1 mile in advance of the entry point where a general-purpose lane becomes a preferential lane that does not provide continuous access with the adjacent general-purpose lanes. FHWA also proposes to require a yellow panel with black legend and border displaying a down arrow and the word ONLY on the Advance Guide and Entrance Direction signs and to add a new Figure to illustrate an example of these signs. FHWA proposes this change to provide road users with sufficient advance notice to change lanes if they desire to continue in the general-purpose lanes, consistent with signing for dropped lanes at interchanges.

FHWA also proposes to indicate that several of the Standards and Guidance in this section apply to freeways and expressways, because such provisions are not appropriate for conventional roads.

248. In Section 2G.17 (existing Section 2G.16) Signs for Priced Managed Lanes—General, FHWA proposes to delete the last Standard statement regarding the use of the diamond symbol because it is redundant with the provisions of Section 2G.03.

249. In Section 2G.19 (existing Section 2G.18) Guide Signs for Priced Managed Lanes, FHWA proposes to add a new Standard statement and accompanying figure prohibiting the use of ETC-account pictographs on the primary guide sign directing traffic to the managed lane when registration in a toll-account program is not required for travel in a managed lane in which tolls are charged. In such cases, FHWA proposes that the purple header panel shall be replaced with a warning header panel with a black legend and border on yellow background displaying the word TOLL. FHWA proposes this change to provide consistency in signing for toll facilities where registration is not required for travel for the purpose of improving traffic efficiency and safety.

FHWA also proposes to add an Option provision allowing the legend TOLL BILLED BY MAIL ONLY on a separate information sign within the sequence of primary guide signs in advance of an entrance to the managed lane if the managed lane does not accept toll payments from an ETC account system and collects tolls only by post-travel billing of registered vehicle owners.

FHWA proposes to add another Option allowing pictographs of the accepted ETC account programs and the

legend TOLL BILLED BY MAIL on a separate information sign within the sequence of primary guide signs in advance of an entrance to the managed lane if the managed lane accepts payments from registered ETC accounts but does not require registration to use the lane.

250. In new Section 2G.20, Signs for Part-Time Travel on a Shoulder—General, FHWA proposes to add a Support statement regarding the general applicability of part-time travel on shoulders and factors to consider when planning traffic control for such operations. FHWA also proposes to add a figure showing an example of signing for part-time travel on a shoulder.

FHWA proposes a Standard stating that shoulders open to travel on a permanent full-time basis shall be signed and marked as a standard travel lane to be consistent with other travel lanes open on a full-time basis and to accommodate the expectancy of road users.

251. In new Section 2G.21, Regulatory Signs and Plaques for Part-Time Travel on a Shoulder, FHWA proposes a Standard requiring signs and plaques to notify road users of the periods of operation that travel is allowed on a paved shoulder. FHWA proposes to require the use of a Part-Time Travel on Shoulder Operation (R3–51) sign where traffic is allowed to travel on the shoulder during certain fixed periods of operation and the use of the Part-Time Travel on Shoulder Variable Operation (R3–51d) sign with two flashing beacons mounted above it when the period of operation is variable. FHWA proposes these two signs to provide road users with specific signing that distinguishes between fixed period and variable operation, along with beacons to indicate when use of the shoulders is allowed for variable operation. FHWA also proposes to require the use of Selective Exclusion plaques to convey any restriction on certain types of vehicles.

FHWA also proposes an Option to allow an EMERGENCY STOPPING ONLY OTHER TIMES (R3–51cP) plaque to be mounted below the R3–51 sign if the Selective Exclusion plaques are not used.

FHWA proposes Guidance recommending the use of the TRAVEL ON SHOULDER BEGINS ½ MILE (R3–52c) sign be used in advance of the location where part-time travel on the shoulder first begins followed by the DO NOT DRIVE ON SHOULDER (R4–17) sign appropriately spaced downstream in order to provide road users with additional information regarding the use of the shoulder.

FHWA also proposes a Standard requiring use of the TRAVEL ON SHOULDER ENDS (R3–52A), END TRAVEL ON SHOULDER (R3–52), and DO NOT DRIVE ON SHOULDER (R4–17) signs, appropriately sequenced, to indicate the termination of the shoulder travel allowance. FHWA proposes this sequence of signs to provide consistency in signing and improve safety at all locations that allow part-time travel on shoulder by providing a common understanding of when shoulder travel is no longer allowed.

FHWA also proposes Guidance regarding the BEGIN EXIT LANE (R3–56) sign, the EMERGENCY STOPPING ONLY (R8–7) sign, and the TO TRAFFIC ON SHOULDER (R3–57P) plaque used at the beginning of deceleration lanes where traffic is allowed to enter during the periods that travel is prohibited on the shoulder, at turnouts provided for emergency stopping during periods when travel is allowed on the shoulder, and below YIELD signs where traffic on an entrance ramp is required to yield to traffic using the shoulder, respectively. FHWA proposes these recommendations to provide traffic control devices to manage traffic more effectively in these circumstances.

252. In new Section 2G.22, Warning Signs for Part-Time Travel on a Shoulder, FHWA proposes Guidance to use the TRAFFIC USING SHOULDER (W3–9) sign at entrances to freeways and expressways where part-time shoulder travel is allowed in order to provide adequate warning to entering traffic.

FHWA also proposes to add an Option to use the W3–9 sign on conventional roads where traffic that is required to stop for or yield to the through street or highway on which part-time travel is allowed on the shoulder, to provide flexibility for this sign's use.

253. In new Section 2G.23, Guide Signs for Part-Time Travel on a Shoulder, FHWA proposes a Standard that the Advance and Exit Direction guide signs shall be modified to include a blank-out or changeable EXIT ONLY message if an interchange lane drop is created during the periods when a shoulder is open to travel. This is to ensure adequate warning to road user and create consistency with requirements for such guide signs in similar lane configurations.

FHWA also proposes a Standard requiring other Guide signs used in conjunction with these facilities to be compliant with the provision of Chapters 2D and 2E to ensure consistency of all guide signs on the roadway.

FHWA also proposes Guidance recommending the use of Emergency Turn-Out directional signs (D17–6) where turnouts are provided for emergency stopping to provide road users with notice of where stopping is allowed in the case of an emergency.

254. In new Section 2G.24, Lane-Use Control Signals for Part-Time Travel on a Shoulder, FHWA proposes an Option to allow the use of overhead lane-use control signals to indicate when a shoulder is open or closed to travel.

FHWA also proposes a Standard that when lane-use control signals are used for part-time travel on a shoulder, they shall follow the provisions of Chapter 4T; that lane-use control signals are not required to be used on adjacent travel lanes; and that a steady red X signal indication shall be used to close the shoulder to all travel except emergencies. FHWA also proposes to require that when part-time travel on a shoulder is allowed for variable periods of operation, lane-use control signals shall be used and evenly spaced approximately evenly ½ mile or less and centered over the shoulder to indicate the status of the shoulder travel allowance. FHWA proposes the use of the green down arrow during times when travel is allowed on the shoulder, a yellow X just before the shoulder is to be closed to travel, and a red X when shoulder travel is discontinued. As part of this proposal, FHWA proposes to require that during the period when the shoulder is open to travel, a lane-use control signal that continuously displays a yellow X be used approximately ½ mile in advance of the location where part-time travel on the shoulder ends, and then displays a red X when the travel on shoulder ends. In addition, FHWA proposes to require the use of a lane-use control signal with a red X display at all times at the location where part-time travel on the shoulder ends. For part-time travel on shoulder with variable periods of operation, FHWA proposes an Option allowing the use of post-mounted TRAVEL ON SHOULDER ALLOWED WHEN FLASHING (R3–51d) signs with flashing beacons be used lieu of the lane-use control signals at the same intervals. FHWA also proposes an Option allowing the use of the TRAVEL ON SHOULDER ON GREEN ARROW ONLY (R3–51e) sign with a lane-use control signal. The R3–51e sign may be mounted adjacent to the signal head, elsewhere on the signal support, or post-mounted next to, or in advance of, the signal. FHWA proposes these additions to provide consistency with other lane-use control signal applications.

255. In new Section 2G.25, Lane-Use Control Signals for Active Lane Management on Freeway and Expressways, FHWA proposes a Standard that lane-use control signals used in this application shall be compliant with the provisions of Chapter 4T to ensure consistency across all applications to road users.

FHWA also proposes an Option to allow a steady yellow X signal indication to be displayed on one or more lane-use control signals in advance of the steady yellow X signal indication required before on the last signal before the point of lane closure. FHWA proposes this to provide flexibility where more advance warning of a lane closure ahead is considered necessary.

FHWA also proposes a Standard that lane-use control signals shall be used only to supplement temporary traffic control devices when used during a planned road closure. FHWA proposes this language to clarify the existing requirement for temporary traffic control devices in this application as provided for in Part 6 of the MUTCD.

FHWA also proposes Guidance on spacing lane-use control signals at 1/2 mile intervals, or closer spacing when certain geometric conditions exist, or when intervening interchange ramps are not adequately served by 1/2-mile spacing. This is to ensure road users have adequate warning of lane-use restrictions at all times.

FHWA also proposes Guidance to minimize the combining of lane-use control signals with overhead sign structures. This is proposed to minimize the informational load on the road user and avoid conflict or incorrect messaging.

256. In new Section 2G.26, Variable Speed Limits for Active Traffic Management on Freeways and Expressways, FHWA proposes a Standard requiring the regulatory speed display on a changeable speed limit signs comply with Paragraph 2 of Section 2B.22 of the MUTCD. This is proposed to ensure that variable speed limit sign designs are consistent across all roadways to improve recognition, which leads to better traffic operations and increased safety.

FHWA also proposes to add Guidance that the location and positioning of Variable Speed Limit signs should associate the speed displayed on them to the lane or lanes intended to be regulated to avoid potential confusion as to the applicability of the speed limit.

FHWA also proposes Guidance that variable speed limit signs, in addition to post-interchange placement, should be spaced based on an engineering study

considering multiple factors including known congestion points to adjust the operating speed to minimize the extent of vehicle queuing and improve safety.

Discussion of Proposed Amendments to Chapter 2H General Information Signs

257. In Section 2H.01 (existing Section 2H.02) retitled, "Scope," FHWA proposes to add a Standard indicating there are circumstances where descriptive messages not relevant to navigation and orientation shall not be included in the legends of General Information signs. This clarification is needed to ensure that traffic control devices are employed only for their intended purpose of regulating, warning, and guiding road users.

FHWA proposes to revise existing P3 to provide an exception for the color and shape of State Welcome signs, Acknowledgement signs, and Alternative Fuels Corridor signs, rather than jurisdictional boundary signs.

FHWA also proposes to re-designate all signs in this Chapter to be consistent with the alphanumeric designations for all other signs in the Manual.

258. In Section 2H.02 (existing Section 2H.01) Sizes of General Information Signs, FHWA proposes to revise the Option allowing sign sizes to be larger than those contained in Table 2H-1 to add an exception that larger sizes may not be used where a maximum allowable size is specified. FHWA proposes this change to restrict the use of over-sized signs only to those situations where appropriate.

FHWA also proposes to delete the Recycling Collection Center (I-11) symbol sign from the MUTCD because residential and curbside recycling make the need for this sign obsolete and separate Recycling Centers, apart from waste disposal facilities, generally do not exist anymore.

FHWA proposes to relocate existing Standard P14 regarding the height of a pictograph on a political boundary General Information sign to new Section 2H.05 to consolidate information in one location.

259. FHWA proposes to add a new Section 2H.03 titled, "Airport Signs," which contains portions of existing Section 2H.02. FHWA proposes to add a new Standard prohibiting the use of airport pictographs or other graphical representation of the specific airport with or in place of the specific airport name on guide signs. FHWA proposes this change in concert with similar changes throughout the Manual based on human factors research^{44 45} that

demonstrated observers generally required longer reading times for signs that added pictographs, while the pictographs themselves did not improve comprehension of the sign message.

In addition, FHWA proposes to change the provision regarding trailblazer signs from a Standard to Guidance to recommend, and not require, these signs prior to the airport guide signs. FHWA proposes this change to make the provisions more flexible in applying engineering judgment in specific situations.

260. In Section 2H.04 (existing Section 2H.03) Traffic Signal Speed Sign (I1-1), FHWA proposes to add a new Standard requiring the electronic-display changeable section of the Traffic Signal Speed sign to be a white legend on a black opaque or green background. FHWA proposes this change to provide uniformity for this portion of the sign, consistent with the provisions for changeable message signs that allow the background portion of the sign to match the static sign.

FHWA also proposes to remove the Standard describing the minimum size of the Traffic Signal Speed Sign as that information is contained in existing Table 2H-1.

261. FHWA proposes to add a new section numbered and titled, "Section 2H.05 Jurisdictional Boundary (I2-1) Signs," to provide Option, Guidance, Standard and Support statements specifically related to Jurisdictional Boundary signs, which are referred to as Political Boundary signs in the current MUTCD. FHWA proposes this new section in concert with the proposed change in Section 2H.01 (existing Section 2H.02) to differentiate between State Welcome signs and Jurisdictional Boundary signs.

262. FHWA proposes to renumber and retitle section 2H.04 Miscellaneous Information Signs (I2-2) to, "Section 2H.06, Geographic Feature (I2-2) Sign," and to make appropriate sign title changes throughout this section to have the sign title better align with the stated intent of these signs, which is to orient road users on the roadway based on geographic features.

263. FHWA proposes to add a new section numbered and titled, "Section 2H.07 State Welcome Signs," to provide information regarding the design, placement, and function of State Welcome signs, which have a different purpose from Jurisdictional Boundary signs that identify and mark State lines. The new section contains provisions for

⁴⁴ FHWA Official Ruling No. 2-650(E), "Sports Team Logos on Guide Signs."

⁴⁵ "Sports Logo Evaluation Report," Perez, W. et al., November 2011.

the location, display, and size of State Welcome signs.

264. FHWA proposes to add a new section numbered and titled, “Section 2H.08 Future Interstate Signs (I2–4, I2–4a),” to provide provisions for Future Interstate Route and Future Interstate Corridor signing along an existing route that has been designated to be reconstructed as an Interstate route or along an existing route adjacent to a corridor through which an Interstate route will be constructed. The new section contains provisions for the location, spacing, and legend of Future Interstate and Future Interstate Corridor signs. In concert with this change, FHWA amends 23 CFR part 470, subpart A, appendix C, “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).” Specifically, FHWA proposes to delete the existing text of the section entitled, “Sign Details,” and instead refer to the MUTCD for any criteria involving highway signing for this purpose.

265. FHWA proposes to add a new Section numbered and titled, “Section 2H.09 Project Information Sign (I2–5)” with Support and Standard statements related to signs that are used to provide limited information about ongoing highway construction projects. FHWA proposes this section to standardize the design and use of signs provided for in 23 CFR 635.309(o). In concert with this change, FHWA proposes to amend 23 CFR 635.309(o) to refer to the MUTCD for any criteria involving Project Information signs.

266. FHWA proposes to add a new section numbered and titled, “Section 2H.10 Grade Separation Identification Signs (I2–43, I2–43a),” to provide Option and Guidance on these signs used for identifying a grade separation from another highway or transportation facility such as a railway, bikeway, or pathway.

267. In Section 2H.11 (existing Section 2H.05), retitled, “Reference Location Signs (D10–1 through D10–3) and Intermediate Reference Location Signs (D10–1a through D10–3a),” FHWA proposes to revise the Option to indicate that Intermediate Reference Location (D10–1a to D10–3a) signs may also be installed at two tenths of a mile or one-half mile intervals.

FHWA also proposes to delete two Standard Statements in this section describing the sign design requirements as these designs are standardized and must comply with the existing provisions of Chapter 2A.

268. In Section 2H.12 (existing Section 2H.06), retitled, “Enhanced Reference Location Signs (D10–4) and Intermediate Enhanced Reference Location Signs (D10–5),” FHWA proposes to add a Standard statement to clarify that the display of a decimal point and zero numeral is required on Intermediate Enhanced Reference Location (D10–5) signs used at the integer mile point. FHWA proposes this addition to improve recognition of the sign message through the use of a consistent numbering nomenclature and provide consistency with the same requirement in Section 2H.10 for Reference Location Signs (D10–4) and Intermediate Reference Location Signs (D10–5).

FHWA also proposes to remove the allowance of blue background enhanced reference location signs, requiring them to be green, to establish uniformity.

FHWA also proposes to remove the sign design provisions for these signs as the designs are standardized and are required to comply with the existing provisions of Chapter 2A.

269. FHWA proposes to relocate Section 2H.07, “Auto Tour Route Signs,” to Chapter 2D and combine with Section 2D.57, “State-Designated Scenic Byway, Historic Trail, and Auto Tour Route Signs.”

270. In Section 2H.13 (existing Section 2H.08) retitled, “Acknowledgment Signs and Plaques (I20 Series),” FHWA proposes several revisions to reflect FHWA Order No. 5160.1 A,⁴⁶ that cancels FHWA Order 5160.1,⁴⁷ both of which are related to FHWA Policy on Sponsorship Acknowledgement and Agreements within the Public Right-of-Way. FHWA proposes this change to minimize the number of additional signs and informational load imposed on road users.

FHWA proposes to change the Guidance related to acknowledgment sign policy provisions to a Standard to ensure sign design and placement of these signs does not conflict with other provisions in the MUTCD.

FHWA also proposes to add a Standard requiring that Acknowledgment signs and plaques have a white legend on a blue background and be independent post-mounted roadside installations only and not be overhead-mounted. This change

is proposed to ensure these signs are consistent with other service type signs and maintain their purpose of acknowledging sponsors of services only.

FHWA proposes to add an Option allowing new Rest Area and Welcome Center Acknowledgement signs (I20–4 and I20–4a) that provides the name of the rest area and welcome center sponsor. In concert with this change, FHWA proposes a new Standard prohibiting the names or representations of specific products or services provided by the sponsor within the rest area to be included on the sign. FHWA also proposes to add a Standard prohibiting the use of program names or slogans on rest area guide signs or other traffic control devices.

FHWA proposes to revise the Standard paragraph regarding acknowledgment signs and plaque designs to include additional provisions related to orientation, dimension, area of the sign, and sizing the sign based on standard sizes specified in Table 2I–1. FHWA proposes these changes so that the MUTCD provisions for these signs are consistent with FHWA Order 5160.1A⁴⁸ and sign size requirements established earlier in this Chapter.

FHWA proposes an Option paragraph allowing for the name of the municipality or neighborhood in which the sponsoring outlet of a business is located if there are multiple locations in the same area. FHWA proposes this change to allow for the acknowledgment of the specific franchisee in cases in which the corporation itself is not the sponsor.

FHWA proposes to add an Option permitting Acknowledgement plaques to be mounted below General Service signs to acknowledge a sponsor of a corridor- or region- based highway-related service including Radio-Weather Information (D12–1), Radio-Traffic Information (D12–1a), TRAVEL INFO CALL 511 (D12–5 and D12–5a), and Roadside Assistance (D12–6) signs. In concert with this change, FHWA proposes Standard paragraphs prohibiting the installation of an Acknowledgment plaque in conjunction with other signs or traffic control devices and limiting the legend that can be displayed on an Acknowledgment plaque.

271. FHWA proposes to add a new section numbered and titled, “Section 2H.14 Alternative Fuels Corridor Sign” to provide Standard, Option, Guidance,

⁴⁶ FHWA Order 5160.1A, issued April 7, 2014, can be viewed at the following internet website: <https://www.fhwa.dot.gov/legregs/directives/orders/51601a.cfm>.

⁴⁷ FHWA Order 5160.1, issued March 13, 2012, can be viewed at the following internet website: <https://www.fhwa.dot.gov/legregs/directives/orders/51601.cfm>.

⁴⁸ FHWA Order 5160.1A, issued April 7, 2014, can be viewed at the following internet website: <https://www.fhwa.dot.gov/legregs/directives/orders/51601a.cfm>.

and Support provisions for the use of Alternative Fuels Corridor signs. FHWA also proposes new Figures 2H-9 and 2H-10 to illustrate Alternative Fuels Corridor Sign Assembly examples and an Alternative Fuels Corridor Signing layout example, respectively. This section adds the provisions of FHWA policy memorandum entitled, "MUTCD—Signing for Designated Alternative Fuels Corridors," dated December 21, 2016.⁴⁹

Discussion of Proposed Amendments to Chapter 2I General Service Signs

272. In Section 2I.02 General Service Signs for Conventional Roads, FHWA proposes a new Standard paragraph limiting the use of the Hospital sign to facilities that operate on a full-time basis. FHWA proposes this change to accommodate the expectation of road users that a hospital operates on a full-time basis. In concert with this change, FHWA proposes an Option paragraph allowing the Emergency Medical Services sign to be used for medical care facilities that operate only on a part-time basis.

273. In Section 2I.03 General Service Signs for Freeways and Expressways, FHWA proposes a new Guidance paragraph recommending the use of D9-18 or D9-18a signs for numbered interchanges. FHWA also proposes new Support and Option statements regarding motorist expectations for facilities providing alternative fuels, as well as policy criteria for alternative fuel vehicles to address issues specific to alternative fuel vehicles.

FHWA also proposes to change the Standard requiring sign space be left blank for future services to a Guidance to provide agencies with greater flexibility based on the agency's knowledge of local conditions.

274. In Section 2I.04 retitled, "Interstate Oasis Signing (D5-12 Series)," FHWA proposes to delete the Guidance recommending that names or logos of businesses designated as Interstate Oasis not be included in the Interstate Oasis sign and instead proposes to add a new Option permitting the name of the business designated as an Interstate Oasis to be provided below the Interstate Oasis legend on the D5-12 sign if Specific Service signing is not used at the interchange. FHWA proposes this change based on experience with signing for the Interstate Oasis areas and

recognizing that it may be appropriate to include business names.

FHWA proposes to delete Guidance text indicating that Interstate Oasis signs should have a white legend with a letter height of at least 10 inches and a white border on a blue background as the designs of these signs are standardized and must comply with the existing provisions of Chapter 2A.

FHWA proposes to delete the Interstate Oasis symbol panel, along with the related Standard, based on poor comprehension of the symbol and the fact that no State currently uses the symbol.

Finally, FHWA proposes to add a new Interstate Oasis Directional (D5-12b) sign to provide road users the direction and distance to the Interstate Oasis from an exit ramp.

275. In Section 2I.08, retitled, "Tourist Information and Welcome Center Signs (D5-7 Series, D5-8)," FHWA proposes to revise the Guidance statement regarding the supplemental signs installed with Tourist Information or Welcome Center signs to suggest limiting the number of supplemental sign panels to three (3). FHWA proposes this change for consistency with other provisions in Part 2 related to the amount of information on a sign legend and driver comprehension, thus minimizing the informational load imposed on drivers.

276. In Section 2I.09, retitled, "Radio Information Signing (D12-1 Series)," FHWA proposes to add two new signs: (1) A Radio-Traffic Information (D12-1a) sign and (2) an Urgent Message When Flashing (D12-1bP) plaque. FHWA also proposes to add an Option statement allowing the Urgent Message When Flashing plaque to be mounted below a D12-1 or D12-1a sign when supplemented by warning beacons that flash only when a message related to adverse travel conditions is being broadcast. FHWA proposes these changes to provide additional signs that may be beneficial to agencies that provide radio services. As discussed in the following two items, FHWA proposes to create two new sections that contain material from existing Section 2I.09 to assist practitioners better in finding information.

277. FHWA proposes add a new section, numbered and titled, "Section 2I.10 Channel 9 Monitored Sign (D12-3)" containing existing Option and Standard statements from Section 2I.09 pertaining to the Channel 9 Monitored Sign (D12-3).

278. FHWA proposes a new section, numbered and titled, "Section 2I.11 EMERGENCY CALL XX Sign (D12-4)" containing an existing Option statement

from Section 2I.09 pertaining to the EMERGENCY CALL XX Sign (D12-4).

279. In Section 2I.12 (existing Section 2I.10), "TRAVEL INFO CALL 511 Signs (D12-5, D12-5a)," FHWA proposes to revise the Option statement to allow a pictograph of the transportation agency, or the travel information service or program to be displayed in place of the TRAVEL INFO CALL 511 legend on the D12-5a sign. This is proposed to provide agencies greater flexibility in program identification.

FHWA also proposes to delete the Guidance paragraph related to the maximum pictograph height and add a new Standard establishing the maximum height of the transportation agency or travel information service or program pictograph to be the height of the 511 pictograph that would otherwise be used on the D12-5a sign for the type of roadway it is located. FHWA proposes this change to provide uniformity in the size of travel information signing.

280. FHWA proposes to add a new section numbered and titled, "Section 2I.13 Roadside Assistance Sign (D12-6)," which would permit the use of a new Roadside Assistance sign along a highway that is served by an authorized road assistance program with authorized service vehicles and personnel that provide roadside vehicle repair assistance to road users free of charge. FHWA proposes this change to provide agencies with a consistent sign that would be recognized by road users.

281. In Section 2I.14 (existing Section 2I.11), retitled, "Carpool and Ridesharing Signing (D12-2)," FHWA proposes to revise the existing Standard to add a maximum horizontal dimension of 30 inches for consistency with similar applications to maintain primacy of other more critical signs.

FHWA also proposes to remove the existing Guidance pertaining to legend, border, and background colors as the design requirements of this sign are standardized and must comply with the existing provisions of Chapter 2A.

282. FHWA proposes to add a new section numbered and titled, "Section 2I.15 Signing for Truck Parking Availability (D9-16b through D9-16e)," with Option, Standard, Support, and Guidance statements, as well as two new figures, related to the use of Truck Parking Availability General Service signs that may be used to display the number of available truck parking spaces at roadside areas such as rest areas, welcome centers, and weigh stations, and at facilities off a highway that are open to the public and provide parking for commercial vehicles.

⁴⁹ FHWA Policy Memorandum, "MUTCD—Signing for Designated Alternative Fuels Corridors," issued December 21, 2016, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/policy/alt_fuel_corridors/index.htm.

Discussion of Proposed Amendments to Chapter 2J Specific Service Signs

283. FHWA proposes to replace “logo” with “business identification” signs throughout Chapters 2J and 2K to recognize that a word legend can and often is used in lieu of a logo to identify the business on the Specific Service sign. This generally occurs when the business to be identified does not have a logo, their logo is not widely recognized, or their logo is otherwise unsuitable for display on the sign. The reclassification does not change the allowance for a business or service provider to use a corporate logo on a Specific Service sign.

284. In Section 2J.01 Eligibility, FHWA proposes to delete the 24-hour Pharmacy Specific Service category because there has been little demand and most pharmacies that did obtain a logo on a Specific Service sign have since withdrawn from the associated agency program. Instead, the 24-hour pharmacy would remain as General Service only. FHWA also proposes to remove references to 24-hour pharmacies from Section 2J.02.

FHWA also proposes to remove alternative fuels from the qualifications for a GAS business identification sign panel to eliminate any potential driver expectancy confusion should a facility offer one or more of the many alternative fuels only and not gasoline.

FHWA also proposes to change existing Guidance P10 to Standard, because it is important for States to have a statewide policy for Specific Signing for the program to be successfully implemented in a consistent manner. Such policies already exist in a majority of the States.

285. In Section 2J.02 Application, FHWA proposes to delete 24-hour Pharmacy Specific Service category from Standard P2 because there has been little demand and most pharmacies that did obtain a logo on a Specific Service sign have since withdrawn from the associated agency program. FHWA also proposes to revise existing P2 to address the display of distances explicitly to eligible facilities on the Specific Service signs on the approach to the interchange. While this practice has never been allowed, FHWA proposes this language to provide clarification based on the results of official experimentation and studies demonstrating that the display of distances requires too much time to read and reduces the effectiveness of these signs.

FHWA also proposes to add a new Standard statement prohibiting the inclusion of business identification sign

panels for alternative fuel facilities on GAS Specific Service Signs for those facilities that offer only alternative fuels, but not gasoline. This addition is because driver expectancy for businesses on the GAS sign is that the business sells gasoline, even if one of the several alternative fuels might also be available. In concert with this change, FHWA also proposes to add a Support paragraph identifying the option to sign for alternative fuel facilities with General Service signs and directing users to Chapter 2I for more information on those provisions.

FHWA also proposes Standard, Guidance, and Support statements limiting the allowable number of business identification sign panels for each Specific Service to six and recommending that when there are more than six eligible facilities for one or more categories of service, General Service signs for those services should be used instead. The proposed Support statement explains that Specific Service signs are intended for areas primarily rural in character, and that when services at an interchange are abundant, the character of the area is no longer primarily rural and the need to identify specific types or brands of facilities is generally unnecessary and General Service signs would be more appropriate.

FHWA also proposes to add a Guidance statement recommending that the ATTRACTION Specific Service sign should have no more than four business identification sign panels. FHWA proposes to explain in the Support statement that, because of the considerable variation in the types of attractions found on these signs, and the fact that many do not include well known services or national logos, it is generally more difficult and requires significantly more time to decipher between types of attractions shown on an ATTRACTION sign than for other categories of Specific Service signs where the types of facilities are more uniform.

FHWA also proposes to revise existing Standard P3 to clarify that configurations or arrangements of logo sign panels other than those listed are not allowed.

FHWA proposes to add a new Guidance and a new Option statement recommending that if a service is no longer available from an interchange or intersection, then the legend displaying the service type and direction information should be removed, or may only be covered if there is indication that this service may become available in the near future. This is proposed so that the road user does not misinterpret

the sign as indicating that this type of service is still available, similar to the message on a General Service sign.

Finally, FHWA proposes to add a new Figure 2J–1 to illustrate an example of General Service Signs in Conjunction with Specific Service Signs.

286. In Section 2J.03 Logos and Business Identification Sign Panels, FHWA proposes to add a Guidance statement recommending that graphic or trademarked logos used on a logo sign panel should be consistent with the on-premise business identification signs at the location of the business that are visible from the roadway. FHWA proposes this recommendation to provide consistency between the logo sign panel and the signing on the business and accommodate driver expectancy and positive guidance.

FHWA also proposes to delete the Option allowing the border to be omitted where business identification symbols or trademarks are used alone for a logo. FHWA proposes this change to ensure consistent apparent size and visibility of the individual logos.

FHWA also proposes to revise the Standard regarding supplemental messages on logo sign panels to prohibit specifically additional amenities or products unrelated to the service category because those items are considered promotional advertising. FHWA proposes this revision to clarify the existing provisions, which do not allow for such messages.

FHWA also proposes to add a new Standard explicitly prohibiting the display of messages related to the promotion or availability of logo space on Specific Service signs.

Further, FHWA proposes to add an Option to clarify that supplemental messages identifying an alternative fuel available may be added only to the business identification sign panels on the GAS Specific Services sign for a gas facility that provides that alternative fuel in addition to, rather than in lieu of, gasoline. FHWA proposes this change as a clarification of the Option provision allowing supplemental messages for essential motorist information and to accommodate driver expectancy of the nature of the services displayed.

FHWA also proposes to revise the Guidance provision regarding the legend and background colors of the supplemental messages, recommending they be a black legend on a yellow background for that portion of the business identification sign panel. FHWA proposes this change to make it easier for motorists to recognize supplemental information that is critical to their decision making.

FHWA also proposes to delete the Option and Standard for the alternative circular RV ACCESS supplemental message to standardize the RV ACCESS supplemental message for consistency.

Finally, FHWA proposes to revise the Standard regarding business identification sign panel displays to prohibit a panel from displaying more than one name or identification logo/trademark for the same business and to prohibit marketing slogans. This Standard also does not allow a sign panel to be used to display messages related to the promotion or availability of adding a business identification sign panel. FHWA proposes this change because promotional advertising is not allowed on traffic control devices.

287. In Section 2J.06 Signs at Interchanges, FHWA proposes a revision to the Standard indicating that Specific Service signs shall not be used at freeway-to-freeway interchanges, except at ramps that also provide access to a conventional road within that interchange. FHWA proposes this to ensure drivers are not confused by indicating a service is available on the freeway itself.

To complement the existing Guidance providing recommended minimum spacing between Specific Service ramp signs, FHWA also proposes recommended minimum spacing between Specific Service ramp signs and other signs along the ramp. FHWA proposes this change to ensure that adequate spacing between critical destination, warning, and regulatory signs along the ramp is maintained.

Finally, FHWA proposes to add a new Figure 2J-6 to illustrate an example of Specific Services Signing for a Conventional Road Accessed within a Freeway-to-Freeway Interchange.

288. In Section 2J.07 Single-Exit Interchanges, FHWA proposes to revise Standard P2 to clarify that the provision applies only to those ramps that allow a traffic to turn in either direction of the crossroad. FHWA proposes this clarification to provide greater flexibility to agencies by not requiring the ramp signs when the ramp requires all traffic to turn in one direction of the crossroad, resulting in cost savings to agencies and participating businesses.

FHWA proposes to change the Guidance statement to an Option statement to allow, rather than recommend that Specific Service ramp signs display distances to a facility when not visible from the ramp intersection. FHWA proposes this change to provide agencies greater flexibility in determining whether to display the distance on Specific Service ramp signs.

FHWA also proposes to add a Guidance statement that recommends distances of less than ¼ mile, when displayed, be displayed to the nearest ¼ mile.

Finally, FHWA proposes to delete the Option allowing the use of an exit number plaque on Specific Service signs in advance of an interchange, because the standardized sign already contains the exit number.

289. FHWA proposes to add a new section numbered and titled, “Section 2J.09 Collector-Distributor Roadways for Successive Interchanges,” to include Support, Guidance, and Standard statements regarding signing for a collector-distributor roadway that provides access to multiple interchanges. This proposal includes requirements and recommendation on the number and location of signs based on the number of service facilities available at the multiple interchanges. FHWA proposes this new Section to address the application of mainline Specific Service signing when more than one interchange is accessed from the collector-distributor roadway.

FHWA proposes to add a new Figure 2J-7 to illustrate an example of Specific Services Signing from Collector-Distributor Road.

290. In Section 2J.11 (existing Section 2J.10) Signs at Intersections, FHWA proposes to delete Standard P1 that requires that the specific service information be incorporated into the tourist-oriented directional signs at intersections on conventional roads or expressways when both tourist-oriented directional signs and Specific Service signs are needed. FHWA proposes removing this requirement to provide agencies the flexibility to provide continuity of information on these sign types as may be expected by road users. FHWA also proposes to add Guidance recommending that sufficient space be provided between these different types of signs used at the same intersection so that the road user is not overloaded with information, and a requirement that if sufficient space is not available to add these signs to the other guide, warning, and regulatory signs that either or both of these service sign types shall not be used.

FHWA also proposes to revise the Guidance to remind users that the use of Specific Service signs in non-rural or conventional roadways is subject to an engineering study in compliance with Section 2J.01.

291. In renumbered Section 2J.12 Signing Policy, FHWA proposes to change to a Standard the recommendation that each highway agency that elects to use Specific

Service signs establish a general signing policy and add a requirement for a Statewide policy on the eligibility of service providers. FHWA proposes this change to ensure that States have a policy on eligible businesses for their Specific Service sign program that provides businesses equitable and consistent qualifications for signs, thereby meeting road user expectations while maintaining the recommendations on minimum sign policy criteria to be considered.

Discussion of Proposed Amendments to Chapter 2K Tourist-Oriented Directional Signs

292. In Section 2K.01 Purpose and Application, FHWA proposes to revise the requirement in Standard P4 to clarify that tourist-oriented directional signs shall be limited to use on rural highways. FHWA also proposes to change the terminology from “rural conventional roads” to “rural highways” to match that used for such facilities as provided in Section 1C.02 for clarity.

FHWA also proposes to delete the requirement in Standard P5 that the specific service information be incorporated into the tourist-oriented directional signs at intersections on conventional roads or expressways when both tourist-oriented directional signs and Specific Service signs are needed. This is proposed for consistency with the removal of the same requirement in Section 2J.11 (existing Section 2J.10).

293. In Section 2K.02 Design, FHWA proposes to add a new Standard requiring recreational and cultural interest area symbols to be white on a brown background. In addition, business identification sign panels shall not exceed 24 inches in width and 15 inches in height. FHWA proposes these requirements to comply with sign colors as required in Chapter 2A and ensure the business identification sign panels are proportional in size with a tourist-oriented sign.

294. In Section 2K.04 Arrangement and Size of Signs, FHWA proposes to change the Guidance regarding the maximum number of signs installed in each assembly from four to three to be consistent with guidance provided in Section 2E.10 that no more than two destination names or street names should be displayed on any Advance Guide sign or Exit Direction sign, and consistency with research completed by the Quebec Ministry of Transport⁵⁰ that

⁵⁰ The research report can be viewed at the following internet website: <http://conf.tac-atc.ca/english/resourcecentre/readingroom/conference/>

found road users cannot adequately process the information when more than three destination panels are present in a sign assembly.

295. In Section 2L.01 Description of Changeable Message Signs, FHWA proposes to add a paragraph to the Support statement to clarify that Changeable Message Signs (CMS) are traffic control devices, and therefore fundamental principles for the design and application apply, regardless of the type of message. The statement further explains that Chapter 2L is not a stand-alone chapter and criteria and use of engineering processes in other areas of the MUTCD also apply to CMS.

FHWA proposes to relocate and revise Standard P3 to Section 2L.02, because this language applies to the applications of CMS and not the description of them.

FHWA proposes to add a new Standard prohibiting information other than inventory or maintenance-related information from being displayed on the front or back of a CMS or portable CMS. This prohibition also includes names or logos of the manufacturer either in the message display or on the exterior housing. FHWA proposes this change to ensure the traffic control messages displayed on these signs are not compromised by other miscellaneous or promotional information, consistent with the provisions for all traffic control devices.

296. In Section 2L.02 Applications of Changeable Message Signs, FHWA proposes to relocate and revise Standard P3 from Section 2L.01 because this language applies to the applications of CMS and not the description of them. As part of the revisions, FHWA proposes to clarify that CMS are to display only information as provided for in this chapter and other types of messages not related to traffic control and not provided for in this chapter shall not be displayed on CMS. FHWA proposes this additional language to promote uniformity in the use of CMS and to discourage the use CMS to display messages not provided for in the MUTCD, ensuring that the CMS adhere to the basic principles of an effective traffic control device that are stated in the existing provisions of Part 1.

FHWA also proposes to change existing Option P2 to a Guidance and move the statement earlier in this section to clarify the types of messages to be used on CMS in support of the proposed Standard relocated from Section 2L.01.

FHWA also proposes to add a new Guidance statement recommending that CMS not be used in place of static guide sign messages except for blank-out type signs used to display regulatory, warning, and guidance information that routinely reoccurs but only on a part-time basis. In addition, only elements of a sign that are subject to change should be in an electronic display. FHWA proposes these changes to help ensure consistency in sign design by controlling the potential variability of information that should not change on a sign.

In addition, FHWA proposes to delete Support Item D, messages pertaining to control at crossing situations, from the list of types of messages for which CMS are applicable. FHWA proposes this change, because “control at crossings” is not well understood and such messages would be covered under the other more general categories within the list, such as “Warning situations” or “Traffic regulations.”

FHWA proposes to change existing Guidance P3 to a Standard to require that agencies that have permanently installed or positioned CMS have a policy regarding their use and the display of all types of messages used on CMS. Such policies shall define the types of messages that would be allowed, the priority of messages, the syntax of messages, the timing of messages, and other important messaging elements to ensure messages displayed meet the basic principles that govern the design and use of traffic control devices in general and traffic signs in particular as provided for in the MUTCD. In concert with this change, FHWA proposes that State and local agencies that use CMS that are not permanently installed or positioned should develop and establish a similar policy. FHWA proposes these changes in order to ensure urgent and real-time traffic operational and safety messages developed to address varying roadway and traffic conditions are easily understood, timely, and relevant.

FHWA proposes to include recommendations specific to the display of AMBER alerts, including limiting the length of messages, and details, such as description of persons, vehicles or license plate numbers. In addition, FHWA proposes to add a new Standard paragraph prohibiting other “alert” messages that are not related to traffic or travel conditions that are not otherwise permitted in P2. FHWA proposes this to emphasize that AMBER alert messages are a result of a statutory requirement and are the only “alert” exception to the statute that requires traffic control devices to be related to traffic control.

FHWA also proposes to revise Support P4 to clarify examples of acceptable traffic safety campaign supporting and transportation-related messages.

FHWA also proposes to add new Guidance and Standard paragraphs regarding the appropriate and allowable use of traffic safety campaign messages on CMS displays. FHWA proposes this new language to clarify that safety and transportation-related messages should be clear and direct, and meaningful to the road user on the roadway that the message is displayed. FHWA recommends that messages with obscure meaning, references to popular culture, that are intended to be humorous, or otherwise use nonstandard syntax, 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. FHWA proposes in the 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. Based on the widely varying views that have been expressed on the topic of uses of CMS and message content, including the use of unconventional syntax and humor, FHWA requests that commenters provide sufficient detail and explanation of how their position would maintain the uniformity and effectiveness of CMS for their intended purpose of displaying real-time traffic regulatory, warning, or guidance information. FHWA requests that commenters address, in particular, the use of CMS for messages outside the scope of traffic-related messages, such as those that are intended only to modify driver behavior, the frequency and extent of use for this purpose, and its overall effect on the efficacy of traffic messages when displayed. Specific references should be made to the proposed MUTCD text and the explanation provided in this document. In addition, FHWA requests that commenters provide supporting objective and empirical data, such as those from human factors evaluations, engineering studies, and similar nonsubjective assessments.

FHWA also proposes Support, Standard, and Guidance statements regarding the use of messages related to homeland security and emergencies that affect traffic patterns, movement, or present other situations that are atypical. FHWA proposes these statements to provide provisions for messaging on CMS for such events

while maintain the integrity of and respect for CMS as a traffic control device.

FHWA also proposes to add Guidance that safety campaigns using CMS should include coordinated enforcement efforts when penalties or enforcement warnings are part of the CMS message displayed to road users. FHWA proposes this to maintain the credibility of these signs and improve safety.

297. In Section 2L.03 Legibility and Visibility of Changeable Message Signs, FHWA proposes to add a Guidance statement specifying that changeable message regulatory and warning signs displayed individually or as part of the legend of a larger sign should conform to the minimum size requirements as the static versions of those signs. FHWA also proposes to add a Figure illustrating an example. FHWA proposes this change to ensure that all components of a sign legend's legibility are maintained for all road users.

298. FHWA proposes to change the title of existing Section 2L.04 to "Design Characteristics of Messages," to describe better the content of the section.

FHWA proposes to add a new Standard paragraph requiring portable CMS used as an arrow board with flashing or sequential display for a lane closure to conform with provisions in Section 6F.61. FHWA proposes this change for consistency of device operation used for the same application, because a CMS used in this manner is operating as an arrow board, which is allowed to have dynamic display.

FHWA proposes to add a new Standard paragraph requiring all message displays on CMS, whether for regulatory, warning, or guidance information on traffic operations, or for other allowable message types as defined in the section, follow the same design and display principles found in the MUTCD used for other traffic control signs, except as provided elsewhere in this chapter. FHWA proposes this Standard to promote uniformity in the display of CMS and maintaining its effectiveness as a traffic control device.

FHWA also proposes to provide Guidance that warning beacons should not be used on CMS for the purpose of drawing attention to certain types of messages over others, but instead should be limited to those messages that are critical to real-time conditions on a more frequent basis. FHWA proposes this provision to ensure that CMS maintain the same level of respect of road users expected of all traffic control devices at all times, regardless of message being displayed.

FHWA also proposes to revise Guidance P6 regarding CMS word message lettering heights to clarify what types of CMS the letter heights apply to, and to clarify that the provisions do not apply to blank-out signs.

FHWA also proposes to change existing Guidance P15 regarding legend color when there is a black background to a Standard for sign consistency since changeable message signs can accommodate multiple colors.

FHWA also proposes to delete the last sentence of Support P17 regarding newer technologies of CMS and add reference to a new figure that provides a comparative example of the effects of varying pixel densities.

FHWA also proposes to revise Guidance P18 to recommend where an LED matrix is used to form the changeable legend, signs with pixel spacing greater than 20mm should display only word legends, and no symbols or route shields. FHWA proposes this change based on a review of manufacturer products and visual inspections of the appearance of legends on these types of signs, which indicate that these signs do not provide adequate resolution to display symbols with sufficient clarity for road user instant recognition and therefore should only be use for word messages.

299. In Section 2L.05 Message Length and Units of Information, FHWA proposes to revise Standard P4 to clarify that when a CMS contains more than one message phase, each phase shall be communicated so that the road user may understand each phase by itself regardless of the sequence in which it is read, and the message shall have the same meaning regardless of the sequence it is read. FHWA proposes this change, because it is important that road users be able to understand the intent of the message if they can only read one of the phases or when the phases are read in different order.

FHWA proposes to delete Standard P5 since the text is already covered in Section 2L.04.

FHWA proposes to change Guidance P8 to an Option to clarify that adding additional CMS is an option available to agencies for displaying longer messages that would require more than two phases, which is the most number of phases allowed on a CMS.

FHWA proposes to change and relocate Guidance P9 regarding abbreviations within a CMS message to a Standard. FHWA proposes this change because the provisions contained in the referenced Section are Standards.

FHWA also proposes to add a Support paragraph that provides reference to two proposed new tables that list examples

of message construction for CMS. FHWA proposes these tables to ensure that message recognition, comprehension, and effectiveness is maintained for all road users.

300. FHWA proposes a new section numbered and titled, "Section 2L.06 Frequency of Display of Messages." In this new section, FHWA proposes Support and Guidance paragraphs to address the potential for habituation to changeable message signs due to excessive use for the display of messages that are not related to real-time traffic conditions.

301. FHWA proposes a new Section 2L.07 titled, "Travel Time Messages." In this new Section, FHWA proposes a Guidance paragraph limiting the number of travel times displayed to one when destination and distance are used as the point of reference, also proposing an Option to display up to two travel times when reference-location-based exit numbering is used as the point of reference in place of destination and distance. FHWA proposes this new Section based on the established principles regarding informational load and the road user's ability to process information while operating a vehicle in traffic.

302. FHWA proposes a new section numbered and titled, "Section 2L.08 Traffic Safety Campaign Messages." In this new section, FHWA proposes Support, Guidance, and Standard paragraphs describing the display of traffic safety campaign messages as an ancillary use of CMS. FHWA proposes a Guidance paragraph recommending that traffic safety campaign messages be coordinated with the national safety campaigns on NHTSA's communications calendar. Lastly, FHWA proposes a Standard paragraph that requires traffic control messages to have primacy over traffic safety campaign messages. FHWA proposes this new Section to ensure that CMS be used only for their intended purpose and that traffic-related messages take precedence over other types of allowable messages.

303. In Section 2L.09 (existing Section 2L.06) retitled, "Location of Permanent Changeable Message Signs," FHWA proposes to add a Support paragraph that provides reference to factors that should be considered when deciding on proposed locations for CMS. FHWA proposes this change as proper location of signs helps ensure that message recognition, comprehension, and sufficient reaction time is maintained for all road users.

Discussion of Proposed Amendments to Chapter 2M Recreational and Cultural Interest Area Signs

304. In Section 2M.02 Application of Recreational and Cultural Interest Area Signs, FHWA proposes to add a new Standard paragraph requiring that standard symbols prescribed outside of this section within the Manual that are used on a roadway outside of a recreational and cultural interest area shall use the design and size as prescribed. FHWA proposes this change to clarify existing standards that prohibit the use of alternative symbol signs. The legend and color of the sign shall be as prescribed for the standard symbol sign. In concert with that change, FHWA proposes to add a table, referenced in the Support statement, that indicates which symbols are for use only within recreational and cultural interest area facilities.

305. In Section 2M.04 General Design Requirements for Recreational and Cultural Interest Area Symbol Guide Signs, FHWA proposes to add two new Standard statements requiring that symbols contained in Chapters 2H and 2I used in conjunction with recreational and cultural interest area signing on roadways outside a recreational and cultural interest facility shall have the legend and background color of the symbol sign as prescribed in those respective chapters. FHWA proposes this change as a clarification that the standard colors for General Information and General Service signs are applicable even when located with a recreational or cultural interest area destination and that brown as a sign background color applies only to recreational and cultural interest destinations or activities.

306. In Section 2M.06 Use of Educational Plaques, FHWA proposes to delete the Guidance recommending that the educational plaque remain in place for at least 3 years after the initial installation. FHWA proposes this deletion to provide agencies with greater flexibility and for consistency with similar provisions elsewhere in the MUTCD.

307. In Section 2M.07, retitled, "Use of Prohibitive Circle and Diagonal for Non-Road Applications," FHWA proposes to revise Standard P1 to provide reference to the existing requirements of Chapter 2A to ensure consistency in sign design.

308. In Section 2M.08 Placement of Recreational and Cultural Interest Area Symbol Signs, FHWA proposes to delete Option P3 regarding the placement of the symbol on the Wildlife Viewing Area sign. FHWA proposes this deletion to ensure consistency in sign designs.

309. In Section 2M.09 Destination Guide Signs, FHWA proposes to change the Guidance paragraph regarding the shape and colors of destination guide signs to a Standard and limit the shape of Supplemental Guide signs to rectangular with an Option to use a trapezoidal shape sign on conventional roadways. In concert with this change, FHWA also proposes to add a Standard describing the required shape of the trapezoidal sign when used with a directional arrow. FHWA proposes these changes to eliminate a conflict with existing standards that define the exclusive uses of sign shapes in Chapter 2A and does not result in a new requirement.

310. In Section 2M.10 Memorial or Dedication Signing, FHWA proposes to delete the Option language related to the installation of memorial or dedication signing along the mainline if installation off the main roadway is not practical. FHWA proposes this change because an Option is not needed for deviation from a Guidance paragraph based on engineering judgment and the provisions for locating such signs on the highway are provided in the existing Standard provision.

FHWA also proposes to revise and expand the existing Guidance statement and change an existing Option to Guidance regarding the design of memorial or dedication signs. FHWA also proposes to add a Guidance paragraph referencing Section 2A.03 for locating memorial or dedication signs to ensure adequate visibility of higher priority signs.

Finally, FHWA proposes to add a new Standard prohibiting memorial or dedication signs from displaying a legend that implies that the highway has been officially renamed. FHWA proposes this change to ensure positive guidance, consistency, and minimization of confusion in the information displayed to road users along a particular route.

Discussion of Proposed Amendments to Chapter 2N Emergency Management Signs

311. In Chapter 2N, retitled, "Emergency Management Signs," FHWA proposes to revise the designations of all standard signs to conform to the dual-numbering convention used throughout the rest of the MUTCD. For example, EM-1 would be redesignated EM1-1. This change would result in each Section's title reflecting a revised sign numbering convention.

312. In Section 2N.02, retitled, "Design and Use of Emergency Management Signs," FHWA proposes to

revise Standard P2 to clarify that signs normally in place that conflict with Emergency Management signs shall be removed or covered until such time as the Emergency Management signs are no longer necessary. FHWA proposes to expand the Standard to indicate that except for Evacuation Route signs, Emergency Management signs that are no longer necessitated by the emergency shall be promptly removed and signs that normally provide guidance, warning, or regulation that were removed or covered during the emergency shall be promptly displayed again. FHWA proposes these changes to provide clarity in the appropriate use of Emergency Management signs.

FHWA also proposes to change Standard P3 to a Support statement regarding the Federal Government providing guidance to the States as necessitated by changing circumstances because it is outside the scope of the MUTCD to make such a requirement that does not involve traffic control devices.

313. In Section 2N.03, retitled, "Evacuation Route Signs (EM1 Series)," FHWA proposes to delete certain design information provided in Standard P1 because the design is standardized and must comply with the existing provisions of Chapter 2A.

FHWA proposes to relocate Option text regarding Advance Turn and Directional Arrow auxiliary plaques to Standard P3. The new Standard text would require that Advance Turn and Directional Arrow auxiliary signs have a white arrow and border on a blue background when used with EM1-2 series signs to provide consistency with similar provisions of Chapter 2D, which requires the colors of auxiliary plaques to be consistent with the route sign in a directional assembly.

FHWA also proposes to delete the Option permitting the use of an approved Emergency Management symbol near the bottom of an Evacuation Route sign because the Civil Defense pictograph is no longer used in emergency management applications.

FHWA also proposes to change the Standard statement to a Guidance statement regarding placement of the Evacuation Route sign in advance of an approved evacuation route.

Finally, FHWA proposes to add a Guidance statement recommending the use of the specific Evacuation Route (EM1-2 series) be limited to areas where different evacuation conditions use different evacuation routes to minimize unnecessary use of additional sign legends and associated auxiliary plaques instead of the general Evacuation Route (EM1-1) sign.

314. In Section 2N.04, retitled, “Area Closed Sign (EM2-1),” FHWA proposes to change the Standard to a Guidance to recommend, rather than require, the provisions related to AREA CLOSED sign placement, to provide agencies with flexibility.

315. In Section 2N.05, retitled, “Traffic Control Point Sign (EM2-2),” FHWA proposes to change the usage provisions of the first three paragraphs in the Standard statement to Guidance to provide agencies with greater flexibility. FHWA also proposes to delete the Standard describing the design of the TRAFFIC CONTROL POINT sign, because the design is standardized.

Discussion of Proposed Amendments to Part 3—Pavement Markings

Discussion of Proposed Amendments Within Part 3—General

316. FHWA proposes to reorganize Part 3 to improve the continuity and flow of information regarding the application of markings in the MUTCD by relocating various paragraphs and sections throughout the part, dividing long sections into several sections each having a clearly understandable title and function, and creating a new Chapter 3C Crosswalks to compile information across multiple chapters into one location. The proposed reorganization is reflected in the descriptions below.

Discussion of Proposed Amendments Within Chapter 3A

317. In Section 3A.01 (existing Section 3A.02) Standardization of Application, FHWA proposes to relocate existing P2 to Part 1 to make this provision applicable to all traffic control devices. FHWA proposes this change because all traffic control devices, not just markings, should be in place prior to the opening of any new highway or private road open to public travel.

318. In Section 3A.02 (existing Section 3A.04) Materials, FHWA proposes changing existing P2 from Support to Option because the use of clumps or droplets of material is permissible and the statement is more appropriate as an Option.

FHWA also proposes to relocate existing P5 to Section 3G.04 (existing Section 3F.04) because it describes delineator placement.

319. In Section 3A.03 (existing Section 3A.05) Colors, FHWA proposes to clarify that the use of black markings is an Option that can be used to enhance the contrast of markings on a light-colored pavement.

FHWA also proposes to relocate information regarding purple markings

to Chapter 3F (existing Chapter 3E) Markings for Toll Plazas and Chapter 3H (existing Chapter 3G) Colored Pavement and retain a reference to those locations.

In addition, FHWA proposes to change existing P7 from Option to Standard since markings that simulate official route signs, when used, shall have the same colors as those used for the signs. FHWA proposes this change to ensure uniformity in the application that aids in recognition of the message.

320. In Section 3A.04 (existing Section 3A.06) Functions, Widths, and Patterns of Longitudinal Pavement Markings, FHWA proposes to add Item E to the list of general functions of longitudinal lines to clarify the functions of dotted lane lines and dotted lines used as a lane line or edge line extensions.

In the list of widths and patterns of longitudinal lines, FHWA proposes 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. FHWA proposes this change to improve visibility and consistency on “high speed” facilities and based on research showing improved machine vision detectability.^{51 52}

FHWA also proposes 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 is proposed to clarify the definition based on varying practices for “normal” width lines and to reduce the impact on agencies that use 6 inch lines as their “normal” width.

Also, FHWA proposes to expand the definition for a double line to clarify that the pavement surface must be visible between the lines except when contrast markings are used based on FHWA’s Official Ruling No. 3(09)-41(I).

In addition, FHWA proposes 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.

⁵¹ ATSSA Report, “Evaluation of the Effects of Pavement Marking Width on Detectability by Machine Vision: 4-Inch vs 6-Inch Markings” 2018 can be viewed at the following internet website: https://s3.amazonaws.com/media.atssa.com/Communications/Booklet_2018PMForMV4vs6in_FinalReport.pdf.

⁵² NCHRP 20–106(6) Report in Progress “Road Markings for Machine Vision” 2019 can be viewed at the following internet website: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4004>.

Discussion of Proposed Amendments Within Chapter 3B

321. In Section 3B.01, retitled, “Yellow Center Line Pavement Markings,” FHWA proposes revising P6 to specify that reversible lanes and two-way left turn lanes are exceptions to the requirement for two normal solid yellow lines for undivided roadways with four or more lanes. The proposed provisions explicitly state exceptions that are currently implied in existing Section 3B.03.

322. FHWA proposes a new section numbered and titled, “Section 3B.02 Warrants for Yellow Center Lines” comprised of existing P9 through P13 from existing Section 3B.01. FHWA proposes this change to make it easier to locate the warrant information.

323. In Section 3B.03 (existing Section 3B.02), retitled, “No-Passing Zone Pavement Markings,” FHWA proposes to change the second and third sentences in existing P4 from Standard to Support because they contain design information and not traffic control device requirements and are supported by an NCHRP research report.⁵³

FHWA also proposes to change existing P9 from Option to Support because no-passing zone signing information is contained in Part 2.

In addition, FHWA proposes deleting existing P14–P16 since they are redundant with existing provisions contained in Section 3B.12 (existing Section 3B.09).

324. FHWA proposes to separate existing Section 3B.03 into two new sections, titled, “Section 3B.04 Yellow Pavement Markings for Reversible Lanes” and “Section 3J.03 Islands Designated by Pavement Markings” to separate the content for islands into the chapter devoted to marking and delineation of islands.

325. FHWA proposes a new section numbered and titled, “Section 3B.05 Pavement Markings for Two-Way Left-Turn Lanes” containing P3 through P5 from existing Section 3B.03 and P28 through P30 from existing Section 3B.20.

FHWA also proposes to add a new Guidance paragraph to discourage extending two-way left-turn lane markings to intersections and proposes to add a Support statement indicating that two-way left turn lanes can be transitioned to exclusive left turn lanes. FHWA proposes to modify Figure 3B–7 to correspond to the new recommendations. FHWA proposes this

⁵³ NCHRP Report 605, “Passing Sight Distance Criteria” 2008, can be viewed at the following internet website: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_605.pdf.

change to improve intersection safety by minimizing conflict between corresponding left-turn movements.

326. In Section 3B.06 (existing Section 3B.04), retitled, “White Lane Line Pavement Markings,” FHWA proposes to expand existing P25 by changing existing P26 from Option to Guidance to recommend, rather than just allow, solid white lane lines on approaches to intersections to separate adjacent mandatory turn lanes, and to add a recommended use of solid white lane lines at toll collection points to separate toll lanes, payment methods, channelized movements, or obstructions.

FHWA also proposes to add an Option paragraph allowing solid white lane lines to separate contiguous through traffic lanes on an approach to an intersection, to separate through traffic lanes from auxiliary lanes, and on approaches to crosswalks across multi-lane roadways, reflecting a common current practice.

In addition, FHWA proposes to add new Option and Support paragraphs for providing curved transitions where an edge line, channelizing line, or dotted extension line changes direction. FHWA proposes this change based on the recognition that many agencies currently use curved, rather than angular, transitions for changes in direction.

327. FHWA proposes a new section numbered and titled, “Section 3B.07 White Lane Line Markings for Non-Continuing Lanes” consisting of P6–P19, and P23 of existing Section 3B.04. FHWA proposes to revise existing Standard P13 to add a new Item C requiring a wide dotted white lane line in advance of freeway route splits with an option lane. FHWA proposes this change to provide consistency with existing requirements for similar situations in which traffic in one of the lanes must depart from the main route. In concert with this change, FHWA proposes to add Drawing E showing an example of a route split with option lane to Figure 3B–10 Examples of Applications of Freeway and Expressway Lane-Drop Markings.

FHWA also proposes to change two Options to Standards requiring dotted white line extensions for deceleration lanes at exit ramps and for acceleration lanes at entrance ramps based on recommendations from the National Committee on Uniform Traffic Control Devices’ (NCUTCD) CAV Task Force and NCHRP 20–102(06).⁵⁴

328. In Section 3B.08 (existing Section 3B.05), retitled, “Channelizing Lines,” FHWA proposes to change existing P2 from Option to Support because the information about channelizing lines provides general information and does not provide an option.

FHWA also proposes to add two new Standard paragraphs requiring channelizing lines on both sides of the neutral area for bifurcations created from open-road tolling lanes that bypass a conventional toll plaza and on both sides of the neutral area formed at access and egress points to and from a managed-lane facility. FHWA proposes this change to guide road users around the neutral area either to general purpose lanes or the tolling and/or managed lanes.

In addition, FHWA also proposes to modify existing P3 to change “channelizing lines” to “neutral area” regarding the requirement that other markings in the area be white. In addition, FHWA proposes a new Support listing chevron markings, retroreflective raised pavement markers, and internally illuminated raised pavement markers as items within the neutral area, with section references.

329. In Section 3B.09 (existing Section 3B.06), FHWA proposes to add a Guidance recommending that edge lines on two-lane roadways should be at least 6 inches wide, regardless of the width of the normal line used on the roadway. FHWA proposes to modify existing P2 from Standard to Guidance to recommend against, instead of prohibit, the use of edge line markings through intersections or major driveways. FHWA proposes this change to provide additional practitioner flexibility.

FHWA also proposes to add exceptions for dotted edge line extensions and the part of the intersection with no intersection approach (such as the top of a T-intersection) since these are locations where edge lines are commonly used in practice.

330. In Section 3B.11 (existing Section 3B.08), retitled, “Application of Pavement Markings Through Intersections or Interchanges,” FHWA proposes to change part of P1 requiring that pavement markings extended into or continued through an intersection or interchange be the same width from Standard to Guidance. FHWA proposes this change because the combination of the provision with the existing Option in P2 is more appropriate as Guidance

and the application can be determined using engineering judgment.

FHWA also proposes to relocate to this section an existing Standard requiring that extensions of center lines through intersections, if used, shall be dotted lines. This Standard is an existing requirement contained only in a Note on existing Figure 3B–13 (D) Examples of Lane Extensions through Intersections. This Note is proposed for deletion from the figure to avoid duplication.

FHWA proposes to relocate P2 from Section 3B.09 (existing Section 3B.06) and change from Standard to Guidance for restricting the use of edge line extensions through intersections. FHWA also proposes to relocate and revise P5 from Section 3B.09 (existing Section 3B.06) for maintaining edge lines at driveways that do not meet the definition of an intersection. FHWA proposes the relocations to consolidate provisions regarding markings through intersections.

Also, FHWA proposes to modify Standard P6 to provide an exception to allow solid lines to extend edge lines through intersections or major driveway when there is no intersecting approach. FHWA proposes this change based on feedback from designers so markings will send intended effect and not communicate a conflict where none exists, and to provide additional user flexibility for situations like the top of a T-intersection when the prohibition of solid lines through the intersection is not applicable.

In addition, FHWA proposes to add a new Guidance paragraph recommending that solid lines not be used to extend edge lines into or through intersections or major driveways except through that part of the intersection with no intersecting approach (such as at the top of a T-intersection). FHWA proposes this change to provide drivers a visual cue of side street traffic.

Further, FHWA proposes to delete existing Guidance P8 because the information is related to design and not traffic control device uniformity.

331. In Section 3B.12 (existing Section 3B.09), retitled, “Lane-Reduction Transitions,” FHWA proposes to revise the Standard P3 to state the criteria for lane-reduction transitions more clearly, rather than referring to the Figure, which contains elements that are required, recommended, and optional.

FHWA also proposes to add a new Guidance paragraph and list for recommended markings for lane-reduction transitions, comprising information throughout the Section and contained in existing Figure 3B–14.

⁵⁴ NCHRP 20–106(6) Report in Progress “Road Markings for Machine Vision” 2019 can be viewed at the following internet website: <https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4004>.

FHWA also proposes to delete all the notes in Figure 3B-14 and retitle it to "Examples of Applications of Lane Reduction Transitions."

In addition, FHWA proposes to add a new Option paragraph permitting the minimum taper length to be less than 100 feet on roadways where operating speed is less than 25 mph based on common practice and to provide practitioner flexibility on low speed roadways.

332. In Section 3B.13 (existing Section 3B.10), Approach Markings for Obstructions, FHWA proposes to add a new Option paragraph allowing the minimum taper length to be less than 100 feet on site roadways open to public travel where the operating speed is less than 25 mph based on engineering judgment to provide practitioner flexibility on low speed roadways.

333. In Section 3B.17 (existing Section 3B.14) Raised Pavement Markers Substituting for Pavement Markings, FHWA proposes to upgrade existing Guidance P8 from existing Section 3B.11 to a Standard and relocate it to Section 3B.17, to require that non-retroreflective raised pavement markers shall not be used alone, without supplemental retroreflective or internally illuminated markers, as a substitute for other types of pavement markings due to lack of retroreflectivity and difficulty for machine vision systems.

334. FHWA proposes to delete existing Section 3B.15 Transverse Markings because transverse markings are already defined in Part 1 and the section does not provide information related to the application or operation of traffic control devices.

335. In Section 3B.18 (existing Section 3B.23), retitled, "Curb Markings for Parking Regulations," FHWA proposes to change P2 related to curb markings for parking regulations from Standard to Guidance to allow engineering judgment to determine if signs should be provided based on site conditions.

FHWA also proposes to change P6 from Support to Guidance because yellow and white curb markings used frequently for curb delineation and visibility of parking regulations should be established through the installation of standard signs and the provision is more appropriate as a recommendation.

336. In Section 3B.19 (existing Section 3B.16), Stop and Yield Lines, FHWA proposes to change existing P3 from Option to Standard to require, rather than just allow, a Yield (R1-2) sign, Yield Here to Pedestrians (R1-5 or R1-5a), or Bikes Yield to Pedestrians (R9-6) sign, or some other traffic control

device that requires vehicles to Yield when installing a yield line. This change clarifies ambiguity in the previous Option statement that the pavement marking cannot be installed without an enforceable regulatory sign.

FHWA also proposes a new Support paragraph to provide a reference to Section 9B.12 regarding a sign signing applicable to bicycles also subject to a yielding requirement at a crosswalk.

337. In Section 3B.20, retitled, "Word, Symbol, and Arrow Pavement Markings—General," FHWA proposes to add a new Option paragraph allowing pavement words, symbols, and arrows to be reduced in size no less than 1/4 size, but in relative proportion to the associated full-size word, symbol, or arrow on roadways where the operating speed is less than 25 mph to provide practitioner flexibility on low speed roadways.

FHWA also proposes to delete existing Standard P3 because it not needed to explain that word, symbol, and arrow markings shall be white, except as otherwise provided.

338. In new Section 3B.21 titled, "Word Pavement Markings" that is comprised of P5, P7, P14, P15, P26, P32, and P33 from existing Section 3B.20, FHWA proposes to delete the existing Standard P14 that allows the word STOP to be used in conjunction with a stop line but does not require a STOP sign. FHWA proposes this change because the MUTCD explicitly does not apply to driving aisles within parking areas per Section 1A, and a STOP sign is required with a stop line for all situations that are covered by the MUTCD.

Also, FHWA proposes to revise existing Guidance P5 to note that the bicycle detector symbol is not intended to be 6 feet or more in height.

In addition, FHWA proposes to delete the second sentence of existing paragraph 26 since this is related to traffic control design and not uniformity of the application.

FHWA also proposes to add a new Option paragraph allowing the ONLY word marking to be used or to supplement a preferential lane work or symbol marking based on common practices.

339. In new Section 3B.22 titled, "Symbol Pavement Markings" that is comprised of P12, P16, P17, P18, and P19 from existing Section 3B.20, FHWA proposes two Guidance statements related to the use of route shield markings in option lanes based on a TTI study.⁵⁵

⁵⁵ TTI Report FHWA/TX-10/0-5890-1 "Guidelines for the Use of Pavement Marking

FHWA also proposes to add a new Option paragraph allowing the use of a pedestrian symbol pavement marking that may be used on portions of facilities such as shared-use paths that are reserved exclusively for pedestrian use.

340. In Section 3B.25 (existing Section 3B.24), retitled, "Chevron and Diagonal Markings," FHWA proposes to delete the term "crosshatch" and instead just use the words "chevron" and "diagonal" to describe the marking better and provide more situations where each can be used.

FHWA also proposes to change the existing Option paragraph into separate Guidance paragraphs for chevron and diagonal markings to recommend the intended applications for each. FHWA based this on the NCUTCD CAV Task Force and Automated Driving Systems Task Force joint recommendations that were approved by the Markings Technical Committee in June 2019.

In addition, FHWA proposes to add a new Guidance paragraph recommending white markings for diagonal markings used in on-street no-parking zones and a new Option to allow lines used for diagonal markings in no-parking zones to be 4 inches wide.

Further, FHWA proposes to modify a Guidance paragraph to recommend that the lines used for chevron and diagonal markings to be at least 4 inches wide on roadways where the operating speed is less than 25 mph to provide practitioner flexibility on low speed roadways.

341. In Section 3B.27 (existing Section 3B.19) Parking Space Markings, FHWA proposes to revise the Standard by adding the phrase "on-street" to describe the parking space markings that shall be white. FHWA proposes this change to clarify that off-street parking space markings, such as those used in shopping center parking lots, are not governed by the MUTCD as provided in Item C of Paragraph 3 in the existing Introduction.

342. FHWA proposes to delete existing Section 3B.21 Speed Measurement Markings because they are not traffic control devices. In concert with this change, FHWA proposes to remove the optional speed measurement marking shown on Figure 3B-10, "Examples of Applications of Freeway and Expressway Lane-Drop Markings."

343. In Section 3B.28 (existing Section 3B.22) Speed Reduction Markings, FHWA proposes to change the second sentence in P3 from

Symbols at Freeway Interchanges" 2009, can be viewed at the following internet website: <https://static.tti.tamu.edu/tti.tamu.edu/documents/0-5890-1.pdf>.

Standard to Guidance regarding longitudinal spacing between speed reduction markings. FHWA proposes this change to allow engineering judgment to determine the longitudinal pattern of the markings based on the site conditions.

344. In Section 3B.29 (existing Section 3B.25) Speed Hump Markings, FHWA proposes to add a new Option paragraph allowing discontinuing center line markings, lane line markings, and edge line markings on the profile of the speed hump.

FHWA also proposes to add a new Standard paragraph requiring installing crosswalk markings when a speed hump specifically incorporates a crossing movement for pedestrians, bicycles, or equestrians.

345. FHWA proposes adding a new section numbered and titled, "Section 3B.31 Markings for Diamond Interchange with Transposed Alignment Crossroad" which contains Standards, Guidance, and Support for markings used at these types of interchanges. FHWA proposes to add this information based on an FHWA research study⁵⁶ that has shown that there is potential for wrong-way movements, especially at the crossing points, at these unconventional interchanges. The new information contains proposed Standards for edge lines, lane use arrows, and wrong-way arrows as well as a restriction for flush median islands. The section also contains proposed Guidance recommending edge and lane line extensions through the crossing points and a Support paragraph referencing crosswalk and pedestrian movement information in Section 3C.11 and 9G.05. FHWA also proposes to add Figure 3B-29 to illustrate an example of markings at this type of interchange.

Discussion of Proposed Amendments Within New Chapter 3C

346. In Section 3C.01 (existing Section 3B.18), retitled, "General," FHWA proposes to change a Support statement to a Standard paragraph requiring crosswalk markings at non-intersection crossing locations to improve safety for pedestrians at locations where vehicles may not expect pedestrian crossings. The previous Support required crosswalk markings to mark the crosswalk legally at non-intersection locations. FHWA proposes to revise this Support into a Standard to identify clearly the requirements of

crosswalk markings at non-intersection locations.

FHWA also proposes to add a new Standard paragraph requiring that paving materials used to function as transverse lines to establish a marked crosswalk shall be white and retroreflective. FHWA also proposes that the paving materials be required to use a white additive in the mixture to produce a white surface. FHWA proposes this change to improve target value and visibility of the crosswalk for pedestrian safety and to fulfill the retroreflectivity requirement for traffic control devices, when paving materials, instead of pavement markings, are used to define the marked crosswalk.

347. FHWA proposes to add a new section numbered and titled, "Section 3C.02 Applications of Crosswalk Markings," containing P7-P10 of existing Section 3B.18. FHWA proposes to modify Guidance P8 regarding criteria for engineering studies for crosswalk across uncontrolled roadways to include pedestrian ages, and to change "posted or statutory speed limit" to "speed limit or the 85th-percentile speed."

FHWA also proposes to revise Guidance P9 to discourage the installation of crosswalks across uncontrolled roadways at locations with posted speed limits 40 mph or greater and locations where there is a crash threat due to multiple lane crossings or limited sight distance. FHWA proposes this change to reduce pedestrian crash potential and based on an FHWA study.⁵⁷

348. FHWA proposes to add a new section numbered and titled, "Section 3C.03 Design of Crosswalk Markings," containing P4, P11, P12, and P17 of existing Section 3B.18. FHWA also proposes to add new Standard paragraphs requiring a minimum width of 6 feet for marked crosswalks and a minimum width of 8 feet for crosswalks at non-intersections and where the posted speed limit is 40 mph or greater. FHWA proposes this change to improve the visibility and recognition of pedestrian crosswalks.

FHWA also proposes to modify Guidance P11 to recommend using high-visibility crosswalk markings at marked crosswalks at non-intersection locations to reduce pedestrian crash potential. FHWA further proposes to reduce the second Guidance sentence in P11 to an Option regarding improving

visibility by parking prohibitions on the approach to marked crosswalks.

In addition, FHWA proposes changing P17 from a Guidance to Standard requiring, rather than recommending, crosswalk markings to be located so that the curb ramps are within the extension of the crosswalk markings, where curb ramps are provided. FHWA proposes this change to accommodate users with visual disabilities better.

Lastly, FHWA proposes to add a new Guidance paragraph recommending that transverse crosswalk markings extend the full width of the pavement or edge of intersecting crosswalk to discourage diagonal crossing between crosswalks. FHWA proposes these changes to provide consistency in crosswalk applications.

349. FHWA proposes to add a new section numbered and titled, "Section 3C.04 Basic Crosswalks," with new Support and Option paragraphs to provide information about basic crosswalks, which are comprised of two parallel transverse lines. FHWA also proposes to provide a new Figure 3C-1 illustrating basic crosswalks.

350. FHWA proposes to add a new section numbered and titled, "Section 3C.05 High-Visibility Crosswalks," to provide Support, Option, Standard, and Guidance paragraphs about the various types of high-visibility crosswalks including longitudinal bar, perpendicular, and double-paired designs. FHWA proposes this section to provide agencies with three standard alternatives to improve crosswalk visibility when desired consistent with an FHWA research study.⁵⁸ FHWA also proposes to illustrate these crosswalk types in Figure 3C-2.

351. FHWA proposes to add new sections numbered and titled, "Section 3C.06 Longitudinal Bar Crosswalks," "Section 3C.07 Perpendicular Crosswalks," and "Section 3C.08 Longitudinal Bar Pair Crosswalks," to provide provisions related to the design and spacing for the three new types of high-visibility crosswalks.

352. FHWA proposes to create a new Section numbered and titled, "Section 3C.10 Crosswalks for Exclusive Pedestrian Phases that Permit Diagonal Crossings," for crosswalks for exclusive pedestrian phases that permit diagonal crossing, containing P16 of existing Section 3B.18. FHWA also proposes to add a new Guidance paragraph recommending that the segments of the crosswalk markings that facilitate the

⁵⁶ "Alternative Intersections/Interchanges: Informational Report (AIR)" FHWA-HRT-06-090, April 2009, can be viewed at the following internet website: <http://www.fhwa.dot.gov/publications/research/safety/09060/>.

⁵⁷ FHWA Report FHWA-HRT-04-100 "Safety Effects of Marked versus Unmarked Crosswalks at Uncontrolled Locations" 2005 can be viewed at the following internet website: <https://www.fhwa.dot.gov/publications/research/safety/04100/>.

⁵⁸ "Crosswalk Marking Field Visibility Study" FHWA-HRT-10-068, November 2010, can be viewed at the following internet website: <http://www.fhwa.dot.gov/publications/research/safety/pedbike/10068/index.cfm>.

diagonal crossing should not use high-visibility crosswalk markings since diagonal crossings are typically permitted only when all vehicular movements are stopped at a signalized intersection and because high-visibility diagonal markings through the intersection could be confusing to turning vehicles.

353. FHWA proposes to add a new section numbered and titled, “Section 3C.11 Crosswalks at Diamond Interchanges with a Transposed Alignment Crossroad” to provide Support, Guidance, and Option paragraphs regarding pedestrian movements through these unconventional interchanges. FHWA proposes this new section based on information contained in a research study⁵⁹ that found that pedestrian movements require special considerations to avoid violating driver expectancy or disorienting pedestrians. FHWA proposes to add a new Figure 3C–3 to illustrate locations of pedestrian crossings at diamond interchanges with a transposed alignment crossroad.

Discussion of Proposed Amendments Within Chapter 3D (Existing Chapter 3C)

354. FHWA proposes to retitle Chapter 3D (existing Chapter 3C) to “Circular Intersection Markings” because the provisions apply to a variety of circular intersections, not just roundabouts.

355. In Section 3D.01 (existing Section 3C.01) General, FHWA proposes to modify Guidance P3 to recommend that markings should supplement signs to help road users select the proper lane in the approach to the circular roadway to avoid changing lanes through the departure of the circular roadway based on an NCHRP Report.⁶⁰

356. In Section 3D.02 (existing Section 3C.02) White Lane Line Pavement Markings for Roundabouts, FHWA proposes two new Option paragraphs related to longer lane lines and striped buffer spaces to help vehicles navigate the roundabout.

357. In Section 3D.04 (existing Section 3C.04) Yield Lines for Roundabouts, FHWA proposes to upgrade part of existing Option P1 to a Standard to require that a yield line be used on the entries before entering

multi-line roundabouts. For single-lane roundabouts, the Option remains to allow a yield line on the entry before entering the roundabout.

358. FHWA proposes to add a new section numbered and titled, “Section 3D.06 Arrow Pavement Markings for Roundabouts” containing revisions to P1 and P4–P6 from existing Section 3C.06. FHWA proposes new Guidance paragraphs to recommend not using lane-use arrows on single-lane approaches to circular intersections. FHWA also proposes to add Guidance for two-lane approaches to circular intersections and for approaches with dual left or dual right turns. FHWA proposes these changes to improve consistency in the application of lane-use arrows at circular intersections based on an NCHRP study.⁶¹

In addition, FHWA proposes to add a new Standard paragraph prohibiting lane-use arrow pavement markings between a crosswalk and wide dotted line(s) entering the circular roadway. FHWA proposes this change because road users need adequate advance notification of the permitted movements within each lane and this area of the approach is often obscured by stopped vehicles.

Further, FHWA proposes to change the Option P6 to Guidance to recommend, rather than just allow, lane-use arrows on the roundabout approaches to match the type of arrows (normal or elongated) used on the corresponding regulatory lane-use signs, to improve consistency between signing and markings for better driver comprehension.

Discussion of Proposed Amendments Within Chapter 3E (Existing Chapter 3D)

359. FHWA proposes to revise the title of Chapter 3E (existing Chapter 3D) to “Preferential Lane Markings for Motor Vehicles” to exclude bicycles and move all bicycle lane information to Part 9.

360. In Section 3E.02 (existing Section 3D.02), retitled, “Longitudinal Markings,” FHWA proposes to revise P3 to reference Table 3E–1 (existing Table 3D–1), create a new Table 3E–2 Standard Edge and Center Line Markings for Counter-Flow Preferential Lanes, revise P9 and P10 to reference new Table 3E–2, and remove redundant text. FHWA proposes to make these changes to clarify the preferential lane marking requirements and improve readability.

⁶¹ “Roundabouts: An Informational Guide, Second Edition” NCHRP 672, 2010, can be viewed at the following internet website: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf.

FHWA also proposes to add a new Guidance paragraph recommending that buffer space for a conventional road should be designed so that it is not misinterpreted as a bicycle lane or other type of lane.

In addition, FHWA proposes to add new Figure 3E–4 to illustrate an example of pavement markings used for counter-flow preferential lanes on divided highways.

361. In Section 3E.03 (existing Section 3D.01) Preferential Lane Word and Symbol Markings, FHWA proposes to change existing P3 regarding preferential lane longitudinal markings, word, and symbol markings at the downstream end of the lane from Standard to Guidance to provide agencies the flexibility to determine the ideal location based on site conditions.

FHWA also proposes to revise Standard P6 and combine with P2 and remove Item C. Bicycle Lane since preferential lanes for bicycles are covered in Part 9 and no longer apply in this Chapter and Section. FHWA also proposes to add BUS STOP and TAXI STAND as required word markings for their respective uses in preferential lanes based on common practices.

In addition, FHWA proposes to change P7 regarding preferential lanes with two or more permitted uses in the same lane from Standard to Guidance to remove the requirement for providing both symbols or words and instead allow engineering judgment to prioritize and select either symbols or word markings, or both.

Lastly, FHWA proposes new Standard and Support paragraphs restricting the use of word or symbol markings denoting motorcycle and Inherently Low Emission Vehicles (ILEV). FHWA proposes this change because motorcycle and ILEV vehicle use is communicated using regulatory signing to complement high occupancy vehicle regulations and simplifies enforcement functions.

362. FHWA proposes to add a new section numbered and titled, “Section 3E.04 Markings for Part-Time Travel on a Shoulder” to provide Standard, Guidance, Option, and Support paragraphs for situations where shoulders are designated for use during peak hour conditions to increase roadway capacity. FHWA proposes this change based on a Transit Cooperative Research Program Report⁶² as well as to address increasing needs of agencies to

⁶² “A Guide for Implementing Bus On Shoulder (BOS) Systems” TCRP Report 151, 2012, can be viewed at the following internet website: <http://www.trb.org/Publications/Blurbs/166878.aspx>.

⁵⁹ “Alternative Intersections/Interchanges: Informational Report (AIIR)” FHWA–HRT–09–060, April 2010, can be viewed at the following internet website: <http://www.fhwa.dot.gov/publications/research/safety/09060/09060.pdf>.

⁶⁰ “Roundabouts: An Informational Guide” NCHRP Report 672, 2010 can be viewed at the following internet website: <http://www.trb.org/Publications/Blurbs/164470.aspx>.

add roadway capacity in constrained urban areas.

FHWA also proposes to add a new Figures 3E-5 and 3E-6 to illustrate an example of markings for part time travel on a shoulder.

Discussion of Proposed Amendments Within Chapter 3F (Existing Chapter 3E) Through Chapter 3K (Existing Chapter 3J)

363. FHWA proposes to add a new section numbered and titled, “Section 3F.02 Longitudinal Markings” consisting of P5–P8 from existing Section 3E.01. In this section, FHWA proposes to add two new Guidance paragraphs recommending solid white lane line markings to separate toll lanes, payment methods, or to channelize movements at toll plazas and that the solid lines should begin at the upstream end of the full-width toll lane and continue to the toll plaza.

In existing P6 from existing Section 3E.01, FHWA proposes to change part of the Standard paragraph for maximum widths of purple solid longitudinal markings to Guidance to provide additional practitioner flexibility.

364. In Section 3G.03 (existing Section 3F.03), retitled, “Application,” FHWA proposes to add a new Guidance paragraph recommending using delineators of the appropriate color to indicate lane-reduction transitions where either an outside or inside lane merges into an adjacent lane. FHWA proposes this change to provide consistency in the application of delineators proposed in other Sections.

365. In Section 3H.01 (existing Section 3G.01), retitled, “Standardization of Application,” FHWA proposes to add two new Standard paragraphs limiting the use of colored pavement only where it supplements other markings and prohibiting colors other than those specified in Chapter 3H (existing Chapter 3G) Colored Pavement. FHWA proposes this change to improve upon the previously established widespread system of uniformity in the application of colored pavement.

366. FHWA proposes to add a new section numbered and titled, “Section 3H.02 Materials” to add new Option, Standard, Guidance, and Support paragraphs related to retroreflectivity, minimizing the loss of traction, differentials in skid resistance, and abnormal wear in colored pavement. FHWA proposes this section to provide agencies with information to assist in the selection of appropriate colored pavement materials to improve road user safety.

367. FHWA proposes to add a new section numbered and titled, “Section 3H.03 Aesthetic Treatments in Crosswalks,” with P2 and P6 from existing Section 3G.01 and to add new Standard, Guidance, Option, and Support paragraphs describing appropriate use of aesthetic treatments within crosswalks and to provide examples of acceptable materials and patterns. FHWA also proposes to add a new Figure 3H-1 to illustrate examples of acceptable materials for interior portions of crosswalks. FHWA proposes these changes to reflect FHWA’s Official Ruling No. 3(09)–24(I),⁶³ which was issued in response to a trend by some agencies toward installing aesthetic treatments on roadway pavement that include bright colors, visually complex graphics, images, or words. FHWA believes that this proposed section is necessary because it is important that these treatments not resemble or interfere with the uniform appearance of traffic control devices, which could confuse and distract road users. FHWA’s longstanding position is that these treatments, which are intended to draw the attention of the road user, can distract from the task of operating a vehicle or crossing the roadway as a pedestrian, and that many of the goals of an agency installing these treatments can be accomplished through other means that do not alter or compromise the uniform appearance of traffic control devices.

Based on the varying views that the public has expressed on this topic, FHWA requests that commenters provide sufficient detail and explanation of how their position would maintain the uniformity and recognition of crosswalk markings. Since these types of aesthetic treatments oftentimes are installed with the stated purpose of improving safety (in addition to establishing community identity or for “placemaking” purposes), FHWA requests comment on how allowing more intricate designs and bright colors around standardized crosswalk markings improves the safety or operations at and around the crosswalk, while maintaining the recognition of the crosswalk. FHWA requests that commenters support their position by providing quantifiable and objective data, such as from human factors evaluations, about the safety and operation of vehicular and street traffic, safety and navigation of pedestrians, any assessments of the effects of

nonstandard designs on pedestrians with low visual acuity or other vision impairments, and the ability of machine vision of autonomous vehicles to detect accurately and react appropriately to the markings as a crosswalk or, if not installed with a crosswalk, other type of marking.

368. FHWA proposes to add a new section numbered and titled, “Section 3H.04 Yellow-Colored Pavement” to include Standard paragraphs limiting use of yellow-colored pavement to flush or raised median islands separating traffic flow in opposite directions, left-hand shoulders of divided highways, and left-hand shoulders of one-way streets or ramps.

FHWA also proposes to add Standard paragraphs restricting yellow-colored pavement from being incorporated into reversible lanes, two-way left-turn lanes, or channelizing islands where traffic travels in the same general direction on both sides—to be consistent with other provisions—existing and proposed—in the Manual.

In addition, FHWA proposes to add an Option paragraph to indicate where yellow-colored pavement may be applied along a roadway.

Further, FHWA proposes to add a new Figure 3H-2 to illustrate an example of the use of yellow-colored pavement.

369. FHWA proposes to add a new section numbered and titled, “Section 3H.05 White-Colored Pavement” to include Standard paragraphs limiting use of white-colored pavement to flush or raised island where traffic passes on both sides in the same direction, right-hand shoulders, exit gore areas, and entrance gore areas.

FHWA also proposes to add a Guidance paragraph recommending certain limitations on its use and Option paragraphs stating where it may be applied along a roadway to be consistent with other provisions—existing and proposed—in the Manual.

Further, FHWA proposes to provide a new Figure 3H-3 to illustrate an example of the use of white-colored pavement.

370. FHWA proposes to add a new section numbered and titled, “Section 3H.06 Green-Colored Pavement for Bicycle Facilities” to include Standard paragraphs establishing the use of green-colored pavement for a variety of bicycle facilities and prohibiting its use on shared-use paths, shared-lane markings, crosswalks, and on separated bicycle lanes on an independent alignment.

FHWA also proposes Option paragraphs stating where green-colored pavement can be applied and Guidance

⁶³ FHWA’s Official Ruling No. 3(09)–24 (I), dated August 15, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/3_09_24.htm.

recommending installation of regulatory and guide signing with green-colored pavement.

Further, FHWA proposes to provide a new Figure 3H-4 and revise Figures in Part 9 to illustrate examples of green-colored pavement. FHWA proposes these changes based on Interim Approval No. 14.⁶⁴

371. FHWA proposes to add a new section numbered and titled, "Section 3H.07 Red-Colored Pavement for Public Transit Systems" to include Standard paragraphs establishing the use of red-colored pavement for lanes where general purpose traffic is not allowed and requiring regulatory signs establishing the allowable use of the lane.

FHWA also proposes Option paragraphs stating where red-colored pavement can be applied and a Guidance paragraph recommending red-colored pavement not be used on public transit facilities separated from the roadway or on exclusive alignments.

In addition, FHWA proposes to provide a new Figure 3H-5 to illustrate an example of the use of red-colored pavement. FHWA proposes these changes based on Interim Approval 22⁶⁵ and the results of multiple experimentations across the country, including in the following jurisdictions: City of Chicago, IL; the City of New York, NY; the District of Columbia; the City of Santa Rosa, CA; and San Diego County, CA.

372. FHWA proposes to add a new section numbered and titled, "Section 3H.08 Purple-Colored Pavement for Electronic Toll Collection (ETC) Account-Only Preferential Lanes" to include Standard paragraphs limiting use of purple-colored pavement to lanes approaching toll plazas that are restricted to registered ETC accounts and lanes approaching an Open Road Tolling (ORT) collection facility, and prohibiting its use on an approach that also facilitates other payment methods downstream.

FHWA also proposes Standard paragraphs regarding the use of longitudinal and edge lines to flank the purple-colored pavement.

In addition, FHWA proposes an Option paragraph allowing its use for the entire length of the toll lane or ORT collection facility or for only a portion (or portions). Further, FHWA proposes

to provide a new Figure 3H-6 to illustrate an example of the use of purple-colored pavement.

373. In Section 3I.01 (existing Section 3H.01) Channelizing Devices, FHWA proposes to add an Option paragraph to clarify that orange-colored channelizing devices are allowed to emphasize pavement markings outside of temporary traffic control zones, as long as the devices are not permanent. FHWA proposes to add this Option to facilitate use of channelizing devices in emergency incidents and planned special events, because it is usually not practical for police officers or other authorized personnel to obtain and deploy channelizing devices that match the color of the existing pavement markings.

FHWA also proposes to delete P5 since this information is related to maintenance and not related to traffic control device uniformity.

374. FHWA proposes to add a new section numbered and titled, "Section 3I.02 Tubular Markers" to include Standard, Guidance, and Option paragraphs to provide size requirements and recommended spacing. FHWA proposes this change because the use of tubular markers have become more common and to enhance uniformity.

375. FHWA proposes to revise the title of Chapter 3J (existing Chapter 3I) to "Marking and Delineation of Islands and Curb Extensions" to be more descriptive on the content regarding islands in this Chapter.

376. In Section 3J.02 (existing Section 3I.02) Approach-End Treatment, FHWA proposes modifying existing P1 to recommend either an approach-end treatment, or curb markings, or both at the ends of islands first approached by traffic. FHWA proposes this change to improve operations and safety at islands and decision points, and to meet driver expectation when encountering these facilities.

FHWA also proposes to revise P3 to add a recommendation for raised bars or buttons that project more than 1 inch above the pavement surface to be marked with retroreflective materials. FHWA proposes this change to enhance conspicuity.

377. FHWA proposes to add a new section numbered and titled, "Section 3J.03 Islands Designated by Pavement Markings" to include new Standard paragraphs for pavement marking color requirements for islands and to clarify criteria for islands previously located throughout Part 3. FHWA also proposes a new Option paragraph allowing both chevron and diagonal markings of the same color within the same island. FHWA proposes these changes to

improve consistency in the application of islands designated by pavement markings.

378. FHWA proposes to add a new section numbered and titled, "Section 3J.04 Curb Markings for Raised Island" to include existing P7-P12 from existing Section 3B.23 and P2 of existing Section 3I.04.

FHWA also proposes to change P10 from Support to Option to allow curb markings to be discontinued where the curbs of the islands become parallel to the direction of traffic flow or where the island is illuminated or marked with delineators, based on engineering judgment or study.

In addition, FHWA proposes to change P11 from Support to Option to allow curb markings to be omitted at openings in a continuous median island based on engineering judgment or study.

379. FHWA proposes to add a new section numbered and titled, "Section 3J.05 Pavement Markings for Raised Islands" to include a Standard, Options, Guidance, and Support paragraphs for the application of approach-end treatments, channelizing lines, edge lines, and chevron or diagonal markings for raised islands. FHWA proposes these changes to improve consistency in the application of markings for raised islands, to improve operations and safety at islands and decision points, and to meet driver expectation when encountering these facilities.

FHWA also proposes to provide a new Figure 3J-3 to illustrate an example of the use of diagonal markings in buffer areas between the channelizing line and the raised island.

380. FHWA proposes 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 for the application of curb extension pavement markings. FHWA proposes these changes to improve consistency in the application of markings for curb extensions and uniformity when the application of pavement markings is to be used.

381. FHWA proposes to delete existing Section 3I.03 Island Marking Application and existing Section 3I.04 Island Marking Colors since the paragraphs were either relocated to other sections, are redundant with other MUTCD provisions, or are not related to uniformity.

Discussion of Proposed Amendments to Part 4 Highway Traffic Signals

382. FHWA proposes to reorganize Part 4 by dividing some existing long chapters and sections into several chapters and/or several sections, each

⁶⁴ FHWA's Interim Approval IA-14, April 15, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia14/index.htm.

⁶⁵ FHWA's Interim Approval IA-22, December 4, 2019, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interim_approval/ia22/index.htm.

having a clearly understandable title, and by moving certain material to new locations within Part 4 to consolidate similar information in one place. In some cases, this involves the proposed creation of new chapters and sections that do not exist in the 2009 MUTCD. FHWA believes this proposed reorganization would create a more logical flow of information and make it easier for users to find the content they need. In addition, FHWA proposes to delete text from various sections where such material duplicates or is very similar to existing text in other sections within Part 4 or elsewhere in the MUTCD. These reorganizations and elimination of redundancies are editorial in nature and do not significantly change the technical content or meaning, except as otherwise discussed below.

383. FHWA proposes to allow the optional use of three-section signal faces using flashing yellow arrow (FYA) signal indications that use the middle section to show both the FYA and the steady yellow arrow in Section 4F.08 (existing Section 4D.02) retitled, “Signal Indications for Protected/Permissive Mode Right-Turn Movements in a Shared Signal Face” and Section 4F.15 (existing Section 4D.24) retitled, “Signal Indications for Protected/Permissive Mode Right-Turn Movements in a Separate Signal Face.” This change would allow agencies to convert existing three-section protected-only left- and right-turn signal faces to three-section FYA signal faces, and provide more opportunities to implement variable mode left- and right-turn phasing.

Similarly, FHWA also proposes to allow the option of displaying both the FYA and the steady yellow arrow in the same section for five-section shared left-turn/right-turn signal faces operating in protected/permissive mode in Section 4F.02 (existing Section 4D.17) Signal Indications for Left-Turn Movements—General, 4F.09 (existing Section 4E.21) Signal Indications for Right-Turn Movements—General, and Section 4F.16 (existing Section 4D.25) retitled, “Signal Indications for Approaches with Shared Left-Turn/Right-Turn Lanes and No Through Movement.” FHWA proposes these changes based on Interim Approval 17,⁶⁶ FHWA’s Official Ruling No. 4(09)–15(I),⁶⁷ and supporting

research.⁶⁸ FHWA also proposes revisions to various paragraphs and sections throughout the part to reflect these proposed changes.

384. FHWA proposes to add a new section numbered and titled, “Section 4A.05 Meanings of Bicycle Symbol Signal Indications.” This section defines the meaning of the proposed bicycle traffic signal indications for bicyclists, described in proposed Chapter 4H, based on Interim Approval 16.⁶⁹

385. In Section 4A.08 (existing Section 4D.34) Use of Signs at Signalized Locations, FHWA proposes to change P5 from Standard to Guidance to provide agencies flexibility, based on engineering judgement, to achieve an appropriate balance in visibility for both traffic signal signs and traffic signal faces. The proposed text maintains priority for the visibility of the traffic signal faces.

386. In Section 4B.02, retitled, “Basis of Installation of Traffic Control Signals,” FHWA proposes to add a Guidance paragraph recommending against using traffic control signals to penalize drivers who are speeding. FHWA proposes this change because speeding issues should be addressed through a programmatic approach and through roadway design features, rather than through traffic control signals.

387. FHWA proposes to delete existing Section 4B.05 Adequate Roadway Capacity because the information does not relate to traffic control uniformity and instead discusses roadway design philosophy and therefore is not appropriate in the MUTCD.

388. In Section 4B.05 (existing Section 4B.04) Alternatives to Traffic Control Signals, FHWA proposes to clarify in Option Item M that to reduce vehicular conflicts, a roundabout is an alternative to a traffic control signal. In addition, FHWA proposes to add a Support statement referencing Part 8 regarding installation of roundabouts in proximity to grade crossings. FHWA proposes these changes to reflect Official Change Request 4(09)–76(C).

389. In Section 4C.01 Studies and Factors for Justifying Traffic Control Signals, FHWA proposes to add an exception for temporary traffic signals to

the Standard paragraph requiring an engineering study to justify a traffic control signal. FHWA also proposes to clarify in Guidance P10 that if a minor-street approach has an exclusive left-turn lane, the approach should either be analyzed as a two-lane approach based on the sum of the traffic volumes using both lanes or as a one-lane approach based on only the traffic volume in the approach lane with the highest volume. FHWA also proposes to change P12 from Guidance to Option to allow agencies to determine whether a location with a wide median is considered as one or two intersections for a signal warrant analysis based on the site-specific conditions. FHWA proposes these changes to allow additional flexibility.

In addition, FHWA proposes to add a Guidance statement referring to the alternatives to traffic control signals listed in Section 4B.05. FHWA proposes this change to reflect Official Change Request 4(09)–76(C) and to remind users of the Manual that there are several alternatives to traffic control signals.

390. In Section 4C.02 Warrant 1, Eight-Hour Vehicular Volume, Section 4C.03 Warrant 2, Four-Hour Vehicular Volume, Section 4C.04 Warrant 3, Peak Hour, Section 4C.05 Warrant 4, Pedestrian Volume, Section 4C.06 Warrant 5, School Crossing, Section 4C.07 Warrant 6, Coordinated Signal System, Section 4C.08 Warrant 7, Crash Experience, Section 4C.09 Warrant 8, Roadway Network, and Section 4C.10 Warrant 9, Intersection Near a Grade Crossing, FHWA proposes to change all paragraphs describing the application of the signal warrant criterion to be considered in an engineering study for installing a new traffic control signal from Standard to Guidance. FHWA proposes this change to provide agencies flexibility in performing signal warrant analyses.

391. In Section 4C.02 Warrant 1, Eight-Hour Vehicular Volume, Section 4C.03 Warrant 2, Four-Hour Vehicular Volume, Section 4C.04 Warrant 3, Peak Hour, and Section 4C.08 Warrant 7, Crash Experience, FHWA proposes to change the description of minor-street approaches from higher volume to more critical based on FHWA’s Official Ruling No. 4(09)–59(I).⁷⁰

392. In Section 4C.05 Warrant 4, Pedestrian Volume, FHWA proposes to add an Option allowing the criteria to be applied separately to each direction of vehicular traffic where there is a

⁶⁶ FHWA’s Interim Approval IA–17, August 12, 2014, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia17/index.htm.

⁶⁷ FHWA’s Official Ruling No. 4(09)–15(I), December 12, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_15.htm.

⁶⁸ “Evaluation of the Flashing Yellow Arrow (FYA) Permissive Left-Turn and Yellow Arrow Change Indications in Protected/Permissive Left-Turn Control: The Impact of Separate and Shared Yellow Signal Sections and Head Arrangements,” NCHRP Project 20–07/Task 283, June 2014, can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/171653.aspx>.

⁶⁹ FHWA’s Interim Approval IA–16, December 24, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia16/index.htm.

⁷⁰ FHWA’s Official Ruling No. 4(09)–59(I), September 12, 2016, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/4_09_59.htm.

divided street having a median of sufficient width for pedestrians to wait. This option is a variation of the second sentence of Item B in Paragraph 2 of Section 4C.05 in the 2003 MUTCD and is proposed by FHWA based on Official Ruling No. 4(09)–25(I).⁷¹

FHWA also proposes to change P4 prohibiting the application of the Pedestrian Volume warrant if the distance to the nearest traffic control signal or Stop sign is within 300 feet from Standard to Guidance. FHWA proposes this change to provide more flexibility for agencies when considering installation of traffic signals for pedestrian crossings.

393. In Section 4C.08 Warrant 7, Crash Experience, FHWA proposes to revise Item B in P2 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. In conjunction with this change, FHWA proposes 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. FHWA proposes these changes based on Interim Approval 19⁷² and findings contained in a research study.⁷³

394. In Section 4D.01 General, add a new Standard paragraph requiring the design and operation of traffic control signals to take into consideration the needs of all modes of traffic to enhance mobility and safety for all modes of travel.

FHWA proposes to add a new Guidance paragraph recommending that covers placed over traffic control signal faces not in operation include the backplate if it has a yellow retroreflective strip. The new paragraph also recommends that if a traffic signal with a retroreflective backplate is turned away it should not be oriented such that the backplate border will reflect light back to road users on any approaches to the intersection. FHWA proposes this change based on Official Ruling No. 4(09)–1(I).⁷⁴

⁷¹ FHWA's Official Ruling No. 4(09)–25(I), November 19, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_25.htm.

⁷² FHWA's Interim Approval IA–19, February 24, 2017, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interim_approval/ia19/index.htm.

⁷³ "Crash Experience Warrant for Traffic Signals," NCHRP 07–18, July 5, 2014, can be viewed at the following internet website: <http://www.trb.org/Main/Blurbs/171359.aspx>.

⁷⁴ FHWA's Official Ruling No. 4(09)–1(I), February 22, 2010, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_001.htm.

FHWA also proposes to change P7 restricting signaling midblock crosswalks if they are located within 300 feet of the nearest traffic control signal from Standard to Guidance. FHWA proposes this change to provide more flexibility for agencies when considering placement of midblock crosswalks.

395. In Section 4D.02 (existing Section 4D.03) Provisions for Pedestrians, FHWA proposes to delete P2 in concert with the new Standard added in Section 4D.01 and relocate and revise P1 and relocate P3 from existing Section 4E.03 to this Section.

FHWA also proposes to delete Standard P3 and add a new Guidance paragraph recommending pedestrian signal heads at each marked crosswalk at a location controlled by a traffic control signal.

Finally, FHWA proposes to revise existing Guidance in P4 to align better with the recommendation for an engineering study with specific factors for consideration as outlined in Section 4K.01.

396. FHWA proposes to add a new section numbered and titled, "Section 4D.03 Provisions for Bicyclists," with an Option to allow bicycle signal faces to be used where it is desired to provide separate signal indications to control bicycle movements at a traffic control signal, and a reference to new Chapter 4H Bicycle Signal Faces. FHWA proposes this change due to the increasing bicycle activity and bicycle infrastructure deployment throughout the Country and based on Interim Approval 16.⁷⁵

397. In Section 4D.05 (existing Section 4D.12) Visibility, Aiming, and Shielding of Signal Faces, FHWA proposes to change P1, P2, P3, P7, and P13 from Standard to Guidance to provide agencies flexibility in locating signal faces.

FHWA also proposes to add a new Standard prohibiting the use of ancillary legends on signal face backplates. FHWA proposes this change because backplates are used to improve the contrast between the traffic signal and its surroundings, and adding a legend reduces the contrast and could reduce driver comprehension. Section 2B.60 (existing Section 2B.53) allows the installation of signs adjacent to signal faces to provide the purpose or operation, as needed.

398. In Section 4D.06 (existing Section 4D.13) Lateral Positioning of

Signal Faces, FHWA proposes to add a new Guidance paragraph recommending locating separate turn signal faces at least 3 feet, horizontally and vertically, from the nearest traffic signal face for a different movement on the same approach. FHWA proposes this change to minimize driver confusion and enhance signal visibility.

FHWA proposes to change P7 from Standard to Guidance to provide agencies flexibility in locating signal faces.

FHWA also proposes to revise Standard P10 for supplemental post-mounted signal faces to clarify that the intent is to prohibit the display of left-turn arrows to the right of adjacent through and right-turn lanes, and not to prohibit such a display if an opportunity is available to post-mount a signal face that is to the immediate right of the left-turn lanes. FHWA proposes a similar change for the display of right-turn arrows.

399. In Section 4D.07 (existing Section 4D.14) Longitudinal Positioning of Signal Faces, FHWA proposes to delete Item A.3 of P1 because it redundant with information contained in Section 4D.06 (existing Section 4D.13).

FHWA also proposes to change the existing Item B of P1 from Standard to Guidance to provide agencies flexibility when deciding where to install supplemental near-side signal faces.

400. In Section 4D.08 (existing Section 4D.15) Mounting Height of Signal Faces, FHWA proposes to change all Standards related to the maximum height for vehicular signal faces from Standard to Guidance. FHWA proposes this change because increasing maximum heights does not impact the safety of road and sidewalk users and therefore agencies should have the flexibility to do so where they deem it advisable to meet site conditions.

401. In Section 4D.09 (existing Section 4D.16) Lateral Offset (Clearance) of Signal Faces, FHWA proposes to change the Standard paragraph to Guidance to provide agencies flexibility when designing signal face placement.

402. In Section 4D.10 (existing Section 4D.32) Temporary and Portable Traffic Control Signals, FHWA proposes to delete Item C in P4 because existing Item D supersedes it, and to provide agencies more flexibility in temporary traffic signal control operations. In concert with this change, FHWA proposes to add a new Option permitting temporary traffic signals to operate in semi-actuated mode instead of being placed in flashing mode.

403. In Section 4E.01 (existing Section 4D.06) Signal Indications—Design,

⁷⁵ FHWA's Interim Approval IA–16, December 24, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia16/index.htm.

Illumination, Color, and Shape, FHWA proposes to revise P9 to require that displays meet the minimum requirements of “Equipment and Materials Standards of the Institute of Transportation Engineers” for signal optical units that use incandescent lamps within optical assemblies that include lenses. FHWA also proposes to add the requirements of the publications entitled, “Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Circular Signal Supplement” and “Vehicle Traffic Control Signal Heads: Light Emitting Diode (LED) Vehicle Arrow Traffic Signal Supplement” that pertain to the aspects of the signal head design that affect the display of the signal indications shall be met for light emitting diode (LED) traffic signal modules, except during nighttime conditions, which is addressed in the revised paragraph 11. FHWA proposes this change based on Official Ruling No. 4(09)–28(I).⁷⁶

In addition, FHWA proposes to change P11 from Standard to Support and combine with P12 because it contains general information about signal lenses and is not a requirement for traffic control signals.

404. In Section 4E.02 (existing Section 4D.07) Size of Vehicular Signal Indications, FHWA proposes to require all arrow signal indications to be twelve-inch to enhance safety and conspicuity of the arrow legend. FHWA also proposes to modify the existing Option to allow 8-inch circular indications in a flashing beacon based on Official Ruling No. 4(09)–7(I).⁷⁷

FHWA also proposes to add a new Option allowing the use of different sizes of signal indications in the same face or signal head. This option is a variation of P5 of Section 4D.15 in the 2003 MUTCD. Even though this was implied in the 2009 MUTCD, this new Option would provide agencies explicit flexibility to install twelve-inch arrows with eight-inch circular displays if the conditions permit eight-inch circular displays.

405. In Section 4F.01 (existing Section 4D.05), retitled, “Application of Steady and Flashing Signal Indications during Steady (Stop-and-Go) Operation,” FHWA proposes to add items E and G to Standard P3 to include provisions for flashing red arrow and flashing yellow arrow signal indications for steady

(stop-and-go) mode of operation. FHWA proposes this change to clarify the application of flashing signal indications in steady (stop-and-go) mode based on their addition to the 2009 MUTCD. FHWA also proposes to clarify in Item H that except for under certain circumstances, a steady green arrow signal indication shall be displayed only to allow vehicular movements in the direction indicated, that are not in conflict with other vehicles moving on a green or yellow signal indication, even if the other vehicles are required to yield the right-of-way to the traffic moving on the GREEN ARROW signal indication. FHWA proposes this clarification to reflect Official Change Request 4(09)–75(C).⁷⁸

FHWA proposes to expand existing Option P5 to include conditions where a steady straight-through green arrow may be used to discourage wrong-way turns. FHWA proposes this clarification to reflect Official Change Request 4(09)–75(C).⁷⁹

FHWA also proposes to add a new Standard, prior to existing Standard P13, for signal displays on separate signal faces at pre-signals for left-turn and/or right-turn lanes that extend from the downstream signalized intersection back to and across a grade crossing. FHWA proposes this change to permit agencies to display straight-through green arrow with circular red or circular yellow on the same approach to the pre-signal to improve safety by discouraging road users from inadvertently turning onto railroad or light rail transit (LRT) tracks.

406. In Section 4F.02 (existing Section 4D.17) Signal Indications for Left-Turn Movements—General, FHWA proposes to change P1 from Standard to Support because the paragraph provides information regarding the applicability of signal indications for U-turns to the left and is more appropriate as a Support statement.

FHWA also proposes to revise Standard P5 to prohibit explicitly the simultaneous display of a protected left-turn movement with opposing right-turn green arrow or yellow arrow signal indication unless there are separate departure lanes available and there are pavement markings or a channelizing island clearly indicating which departure lane to use. This prohibition has been implicit in the description of what constitutes conflicting movements elsewhere in Part 4, but FHWA proposes

this change to be specific about conflicting movements between left-turns and opposing right-turns.

In addition, FHWA proposes to modify Standard P6 to clarify which signal displays are prohibited when a combined left-turn/through lane exists on an approach.

FHWA proposes similar changes in Section 4F.09 (existing Section 4D.21) for right-turn movements.

407. In new “Section 4F.04 Signal Indications for Permissive Only Mode Left-Turn Movements in a Separate Signal Face,” new “Section 4F.06 Signal Indications for Protected Only Mode Left-Turn Movements in a Separate Signal Face,” new “Section 4F.08 Signal Indications for Protected/Permissive Mode Left-Turn Movements in a Separate Signal Face,” new “Section 4F.11 Signal Indications for Permissive Only Mode Right-Turn Movements in a Separate Signal Face,” new “Section 4F.13 Signal Indications for Protected Only Mode Right-Turn Movements in a Separate Signal Face,” and new “Section 4F.15 Signal Indications for Protected/Permissive Mode Right-Turn Movements in a Separate Signal Face,” FHWA proposes to add a new Standard in each section prohibiting the use of a separate turn signal face on an approach that does not include an exclusive turn lane. FHWA proposes this change because if an exclusive lane does not exist, then a separate turn signal face should not be provided because both the turning and through vehicles share the same lane and a separate turn signal face can be confusing to road users in this situation.

408. In new “Section 4F.06 Signal Indications for Protected Only Mode Left-Turn Movements in a Separate Signal Face” which consists of P3 of existing Section 4D.19, FHWA proposes to delete the reference to signal instruction sign and requirement for the LEFT ON GREEN ARROW ONLY (R10–5) sign. FHWA proposes this change to remove the undefined term “signal instruction sign” and to provide additional flexibility for the use of traffic signal signs for separate left-turn signal faces operating in a protected only mode.

FHWA proposes a similar revision to new “Section 4F.13 Signal Indications for Protected Only Mode Right-Turn Movements in a Separate Signal Face” which consists of P3 of existing Section 4D.23 to delete the reference to signal instruction sign and requirement for the RIGHT ON GREEN ARROW ONLY (R10–5a) sign.

409. In new “Section 4F.08 Signal Indications for Protected/Permissive Mode Left-Turn Movements in a

⁷⁶ FHWA’s Official Ruling No. 4(09)–28(I), January 25, 2013, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/4_09_28.htm.

⁷⁷ FHWA’s Official Ruling No. 4(09)–7(I), February 8, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_7.htm.

⁷⁸ An inventory of FHWA’s Official Rulings can be viewed at the following internet website: <https://mutcd.fhwa.dot.gov/orsearch.asp>.

⁷⁹ *Ibid.*

Separate Signal Face” which consists of P3–P6 of existing Section 4D.20, FHWA proposes to modify the Standard (P1 in existing Section 4D.20) to allow the display of a steady left-turn red arrow immediately following the steady left-turn yellow arrow signal indication to provide a red clearance interval, enabling the opposing traffic to start up before releasing the permissive left-turn movement.

410. In Section 4F.09 (existing Section 4D.21), Signal Indications for Right-Turn Movements—General, FHWA proposes to delete P6 to allow, when needed, a yellow change interval for the right-turn movement when the status of the right-turn operation is changing from permissive to protected within any given signal sequence. FHWA proposes this change because this yellow change interval is frequently needed when a right-turn overlap is the next phase in order to allow opposing permissive left-turn traffic to clear the intersection.

411. In new “Section 4F.15 Signal Indications for Protected/Permissive Mode Right-Turn Movements in a Separate Signal Face,” which is comprised of existing P2–P6 of existing Section 4D.24, FHWA proposes to allow the display of a steady right-turn red arrow signal indication immediately following the steady right-turn yellow arrow signal indication to provide a red clearance interval, enabling the opposing traffic to start up before releasing the permissive right-turn movement.

FHWA also proposes to add a new requirement to display a steady right-turn yellow arrow and if needed, steady right-turn red arrow following the flashing right-turn yellow arrow for permissive right-turn movements changing to protected right-turn movements when there is an opposing permissive left-turn movement that is being terminated simultaneously. FHWA proposes this change because a yellow change interval and red clearance interval might be needed during a right-turn overlap to allow opposing permissive left-turn traffic to clear the intersection.

412. In Section 4F.16 (existing Section 4D.25), retitled, “Signal Indications for Approaches with No Through Movement,” FHWA proposes to expand information regarding signal displays in situations where all traffic on an approach must turn onto the intersecting roadway. Existing Section 4D.25 does not address situations for approaches where there is no through movement and there is not a shared left-turn/right-turn lane or the lanes operate with variable lane-use regulations.

FHWA also proposes to add an Option to allow the continuous display of a steady circular red signal indication during time when the traffic control signal is being operated in steady (stop-and-go) mode. FHWA proposes to add a new Standard prohibiting the display of circular green and circular yellow signal indications to an approach with no through movement and an approach speed 35 mph or greater, to an approach where the one-way roadway that opposes the approach is an exit ramp from a freeway or expressway, or to an approach where the one-way roadway that opposes the approach has a speed limit of 35 mph or greater. FHWA proposes the new Option and Standards to improve safety by minimizing the potential for road users driving straight through in the wrong direction onto a one-way roadway or exit ramp.

413. In Section 4F.17 (existing Section 4D.26) Yellow Change and Red Clearance Intervals, FHWA proposes to change P2 from Standard to Support because the paragraph describes the function of a yellow change interval, rather than specific requirements.

FHWA also proposes to revise Support P7 to reference “Guidelines for Determining Traffic Signal Change and Clearance Intervals: A Recommended Practice of the Institute of Transportation Engineers,” which contains the current practices for determining the duration of yellow change and red clearance intervals. In addition, FHWA proposes to revise Guidance P14 to recommend the maximum duration of yellow change interval for through movements should be 6 seconds and for turning movements should be 7 seconds. As part of this change, FHWA proposes to delete the second sentence of Guidance P14 and Guidance P15. FHWA proposes these changes to reflect new guidance in the new ITE publication.

414. In new “Section 4F.19 Preemption Control of Traffic Control Signals” consisting of paragraphs from existing Section 4D.27, FHWA proposes to revise the Standard regarding preemption control transitions to permit the shortening or omission of any pedestrian change interval 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. FHWA proposes this change to improve pedestrian safety. The existing MUTCD allows the shortening or omission of the pedestrian change interval regardless of the reason. Unlike boats and trains, emergency vehicles and buses generally have the

ability to slow, stop, or alter their course if necessary to avoid a collision.

FHWA also proposes to add a new Option permitting the display of a distinctive indication to inform law enforcement personnel who are escorting traffic that the traffic control signal has changed because it has been preempted. FHWA proposes this change based on an NTSB recommendation from the results of their investigation into the causes of the fatal truck/train crash that occurred in Midland, Texas, when law enforcement officers were escorting a parade.⁸⁰

In addition, FHWA proposes to modify P11 to recommend that backup power supply for traffic control signals with railroad preemption or coordinated with flashing-light signal systems should provide a minimum operating period sufficient to allow the implementation of alternative traffic control during a power outage. FHWA proposes this change to provide agencies with more guidance on the duration for backup power supplies.

415. In Section 4G.02 (existing 4D.29) Flashing Operation—Transition Into Flash Mode, FHWA proposes to change P1 from Standard to Option because the language does not provide a requirement and is more appropriate as an Option.

416. In Section 4G.04 (existing Section 4D.31) Flashing Operation—Transition Out of Flashing Mode, FHWA proposes to add a new Guidance paragraph providing two recommended display sequences for transitioning out of yellow-red flashing mode where there is a common major-street green interval. FHWA also proposes to revise the existing recommendation for display sequences for transitioning out of yellow-red flashing mode where there is not a common major-street green interval to provide a steady yellow signal indication followed by a steady red clearance interval on the major traffic movement on the major street. FHWA proposes these changes for safety and consistency in signal operations.

417. FHWA proposes to add a new Chapter, numbered and titled, Chapter 4H Bicycle Signals, that includes provisions for the application, design, and operation of bicycle signals. This chapter contains twelve sections and provisions related to the use, warrants, application, size, placement, mounting height, intensity and light distribution, and yellow change and red clearance

⁸⁰ “Highway–Railroad Grade Crossing Collision, Midland, Texas, Accident Report” NTSB/HAR–13/02, November 15, 2012, can be viewed at the following internet website: <https://www.nts.gov/investigations/AccidentReports/Reports/HAR1302.pdf>.

intervals for Bicycle Signal Faces. These sections and provisions are generally consistent with provisions for traffic control signals. A bicycle signal face consists of RED BICYCLE, YELLOW BICYCLE, and GREEN BICYCLE symbol signal indications that controls bicycle movements from a designated bicycle lane or from a separate facility, such as a shared use path. The proposed provisions are based on the Interim Approval 16⁸¹ and multiple experimentations across the Country. One notable change from IA-16 is the removal of the green arrow signal indication requirement when there are conflicts with motor vehicles moving concurrently from an adjacent lane. FHWA proposes this change to provide agencies with an option to control bikeways or bicycle lanes at signalized intersections.

418. In existing Section 4E.03 Application of Pedestrian Signal Heads, FHWA proposes to delete the section and relocate P1 and P3 to Section 4D.02. FHWA proposes to delete P2 in concert with the proposed new Guidance in Section 4D.02 that provides additional flexibility to use pedestrian signals.

419. In Section 4I.01 (existing Section 4E.01) Pedestrian Signal Heads, FHWA proposes to modify P2 to align better with the recommendation for an engineering study with specific factors for consideration as outlined in Section 4K.01.

420. In Section 4I.02 (existing Section 4E.04) Size, Design, and Illumination of Pedestrian Signal Head Indications, FHWA proposes to revise P3 and add new Standard and Guidance paragraphs to provide more accurate references to the ITE standards for pedestrian signal heads.

FHWA also proposes to change P5 from Standard to Guidance. FHWA proposes this change for clarification and because the Walking Person and Upraised Hand symbols could be slightly visible to pedestrians at the far end of a crosswalk when not illuminated, due to sun phantom and other visual phenomena.

421. In Section 4I.03 (existing Section 4E.05) Location and Height of Pedestrian Signal Heads, FHWA proposes to change Standard P2 to Guidance to provide agencies with flexibility in the location of pedestrian signal heads with respect to vehicular signal heads when mounted on the same support.

422. In Section 4I.04 (existing Section 4E.07) Countdown Pedestrian Signals,

FHWA proposes to clarify Standard P6 that countdown displays shall not be used during the red clearance interval of a concurrent vehicular phase that is ending simultaneously with or after the end of the pedestrian phase because countdown displays sometimes overlap across more than one vehicular phase and are used during the red clearance interval of the first overlapped phase.

423. In Section 4I.05 (existing Section 4E.08) Pedestrian Detectors, FHWA proposes adding an Option to address the need for “touch-free” pedestrian push buttons.

FHWA also proposes in Guidance P4 to clarify “easy activation” of pedestrian push buttons as no more than 5 pounds of force to activate to reflect accessibility requirements contained in the Americans with Disabilities Act Accessibility Guidelines (ADAAG), 309.4 Operable Parts. FHWA also proposes several additional criteria for pushbutton locations to provide practitioners with additional guidance related to the placement of pedestrian push buttons in relation to curb ramps, crosswalks, shoulders, and the edge of pavement, as well as recommending a minimum 4-foot continuous clear width for a pedestrian access route. These proposed changes reflect Official Change Request 4(09)-77(C).⁸²

FHWA also proposes to delete P17 since this is a repeat of P23 in existing 4E.11.

424. In Section 4I.06 (existing Section 4E.06) Pedestrian Intervals and Signal Phases, FHWA proposes to add a new Standard requiring the display of a flashing red signal indication when the pedestrian signal heads at a pedestrian hybrid beacon are displaying a flashing Upraised Hand signal indication. FHWA proposes this change to be consistent with the specified operation of pedestrian hybrid beacons in new Section 4J.03 (existing Section 4F.03).

FHWA also proposes to revise existing P4 to reduce the minimum buffer interval from 3 seconds to 2 seconds. FHWA proposes this change based on the results of an official experiment that was performed by the Delaware DOT.⁸³ The experiment concluded there was no statistically significant difference from a safety perspective when the minimum buffer interval was reduced from 3 seconds to

2 seconds. FHWA proposes this change to provide additional flexibility to agencies in optimizing the timing of traffic signals.

In addition, FHWA proposes to revise existing P7 to recommend calculating pedestrian clearance time based on crossing distance measured from the edge of the pavement and not from the shoulder or edge of the traveled way. FHWA proposes this change because pedestrians who are waiting for a walk indication typically do not feel safe waiting on a paved shoulder and instead wait at the edge of the pavement.

Lastly, FHWA proposes to add a Standard requiring the minimum required time for the Walk interval be displayed in addition to the time provided for the leading pedestrian interval at locations where leading pedestrian intervals are being utilized without accessible pedestrian signals. FHWA proposes this change to align with accessible pedestrian signal guidance throughout Part 4.

425. In Section 4J.01 (existing Section 4F.01) Application of Pedestrian Hybrid Beacons, FHWA proposes 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. FHWA proposes this change for consistency with traffic control signal Warrant 4, Pedestrian Volume.

FHWA also proposes 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)⁸⁴ and for consistency with the proposed change in Section 4C.05.

426. In Section 4J.02 (existing Section 4F.02) Design of Pedestrian Hybrid Beacons, FHWA proposes to add Item E in Standard P1 requiring a Stop sign for the minor-street approach when a pedestrian hybrid beacon is installed at or immediately adjacent to an intersection. FHWA also proposes to delete existing items A and C of Guidance P4 regarding placement of pedestrian hybrid beacons with respect to side streets and driveways and the installation of signs and pavement markings. FHWA proposes these changes based on an FHWA evaluation

⁸² An inventory of FHWA's Official Rulings can be viewed at the following internet website: <https://mutcd.fhwa.dot.gov/orsearch.asp>.

⁸³ “MUTCD Experimentation with Countdown Pedestrian Signals and Change Intervals,” Delaware Center for Transportation, University of Delaware, October 2011, can be viewed at the following internet website: <http://sites.udel.edu/dct/files/2013/10/Rpt.-211-Pedestrian-Signals-2d65hei.pdf>.

⁸¹ FHWA's Interim Approval IA-16, December 24, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia16/index.htm.

⁸⁴ FHWA's Official Ruling No. 4(09)-25(I), November 19, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_25.htm.

study of field implementations⁸⁵ of pedestrian hybrid beacons installed at or near intersections, which found that there were no significant safety or operational problems with such locations.

FHWA proposes to add a Guidance statement recommending accessible pedestrian signals be installed in conjunction with a pedestrian hybrid beacon in response to Official Change Request 4(09)–42(C).

FHWA also proposes to change the first sentence of Standard P8 to an Option, allowing the CROSSWALK STOP ON RED or STOP ON RED–PROCEED ON FLASHING RED WHEN CLEAR signs to be installed facing each major street approach to provide agencies flexibility on where to locate these signs. FHWA proposes these changes based on the field experience of agencies that have extensively used pedestrian hybrid beacons.

The 2017 Traffic Control Devices Pooled Fund Study—“Comprehension and Legibility of Selected Symbol Signs Phase IV”⁸⁶ evaluated the comprehension and legibility of various alternatives for signing at midblock hybrid beacon pedestrian crossings. The results indicated that no significant differences were found between the alternatives; however, they did highlight the need for a sign, at least initially, while drivers are learning what actions to take based on the flashing beacon. As a result, FHWA proposes to add a word message sign for jurisdictions that determine the operational need at pedestrian hybrid beacons.

FHWA also proposes a new Standard prohibiting the use of bicycle signal faces at a pedestrian hybrid beacon. FHWA proposes this because the speed at which bicyclists are able to enter and traverse the crosswalk would make it unsafe to allow a green or yellow bicycle symbol signal indication to be shown at the same time that a flashing red signal indication is shown to motorists. If the motorists are shown a steady red signal indication for the entire length of time that the bicycle signal face is showing a green or yellow bicycle symbol signal indication and a red clearance interval, the hybrid beacon would essentially be functioning as a traffic control signal, and not as a pedestrian hybrid beacon.

427. In Section 4J.03 (existing Section 4F.03) Operation of Pedestrian Hybrid Beacons, FHWA proposes to add a new Guidance paragraph recommending that pedestrian hybrid beacons operated as part of a coordinated signal system should not have a variable flashing yellow interval duration on a cycle-by-cycle basis. FHWA also proposes new Guidance that the pedestrian hybrid beacon should remain in the dark condition after a pedestrian actuation has been received until the point in the background cycle when the flashing yellow interval needs to begin to maintain the system coordination. FHWA proposes this change in accordance with Official Ruling No. 4(09)–32(I).⁸⁷

Further, FHWA proposes to add a new Option allowing the pedestrian hybrid beacon to remain in dark condition after a pedestrian actuation until the minimum dark time has been provided, if the minimum dark time has been set on the controller.

FHWA also proposes to add a new Option allowing the use of a steady red clearance interval after the steady yellow change interval. FHWA also proposes to add an Option allowing the alternating flashing CIRCULAR RED signal indications to continue for a short period after the pedestrian change interval has terminated to provide a buffer interval for pedestrians. FHWA proposes these two new Options to increase safety and in accordance with Official Ruling No. 4(09)–14(I).⁸⁸

In addition, FHWA proposes to add an Option to allow a pedestrian hybrid beacon in close proximity to an active grade crossing to be preempted.

Lastly, FHWA proposes to add a Standard requiring a pedestrian hybrid beacon to flash circular yellow signal indications to each major street approach and requiring the pedestrian signal heads to revert to the dark condition when placed into a flashing mode by a conflict monitor or manual switch. The proper signal and pedestrian displays for pedestrian hybrid beacons placed into flashing mode are not addressed in the current MUTCD and this new standard is intended to provide uniformity and consistency for road users.

428. FHWA proposes to change existing Option P9 to Guidance and revise the text to recommend pedestrian

push buttons be used to activate the accessible pedestrian signals at locations where it is not necessary for pedestrians to push a push button detector to receive a WALKING PERSON signal indication, and to provide information in non-visual formats. FHWA proposes this revision to align with accessible pedestrian signal guidance throughout Part 4.

429. In Section 4K.03 (existing Section 4E.11), retitled, “Walk Indications,” FHWA proposes to revise Standard P7 to clarify the existing requirements for a percussive tone for the audible walk indications. The only exception is for locations with two accessible pedestrian signals on the same corner, or on a median, that are associated with different phases and are located less than 10 feet apart, in which case a speech message is required for the audible walk indication. FHWA proposes this change in accordance with Official Ruling No. 4(09)–3(I).⁸⁹

FHWA proposes to delete the second sentence in Support P14 allowing the use of transmitted speech messages, because there is no assurance that all impacted pedestrians would have a transmitter.

FHWA proposes to remove the second sentence of Standard P17 limiting the use of speech walk messages to specific locations. FHWA proposes this revision to avoid redundancy, since this is addressed in greater detail, in P8.

FHWA also proposes to change P17 through P20 from Standard to Guidance to provide agencies flexibility in developing speech walk messages.

FHWA also proposes a new Standard requiring accessible pedestrian signal speech messages in a language other than English to follow the message first stated in English. FHWA proposes this change to establish consistency in the order of such messages when an optional secondary message in a language other than English is used, thereby meeting the expectancy of pedestrians.

430. In Section 4K.04 (existing Section 4E.12), retitled, “Vibrotactile Arrows and Locator Tones,” FHWA proposes to revise P1 and P2 to clarify the requirements for vibrotactile arrows and locator tones to improve safety for pedestrians with visual disabilities.

FHWA also proposes a new Option to allow the pushbutton locator tone to default to deactivated mode during periods when the steady UPRAISED HAND is displayed for the associated

⁸⁵ “Safety Effectiveness of the HAWK Pedestrian Crossing Treatment,” FHWA June 2010, can be viewed at the following internet website: <http://www.fhwa.dot.gov/publications/research/safety/10042/10042.pdf>.

⁸⁶ 2017 Traffic Control Devices Pooled Fund Study—“Comprehension and Legibility of Selected Symbol Signs Phase IV” can be found at the following internet website: <https://pooledfund.org/Document/Download/7559>.

⁸⁷ FHWA’s Official Ruling No. 4(09)–32(I), March 21, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_32.htm.

⁸⁸ FHWA’s Official Ruling No. 4(09)–14(I), August 8, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_14.htm.

⁸⁹ FHWA’s Official Ruling No. 4(09)–3(I), July 30, 2010, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_3.htm.

crosswalk if a passive pedestrian detection system is implemented that activates the locator tone when a pedestrian is present within a 12-foot radius from the push button location, in accordance with Official Ruling No. 4(09)–26(I).⁹⁰

In addition, FHWA proposes to change the second portion of P6 from Standard to Guidance to recommend, rather than require, that pushbutton locator tones to be audible 6 to 12 feet from the pushbutton, or to the building line, whichever is less. FHWA proposes this change to provide agencies additional flexibility in locating pushbutton locator tones and pushbuttons.

431. In Section 4K.05 (existing Section 4E.13), retitled, “Extended Push Button Press Features,” FHWA proposes to change P7 from Option to Guidance to recommend that audible beaconing be initiated by an extended pushbutton press. FHWA makes this change to provide more consistent applications of audible beaconing.

FHWA also proposes to add a value of 100 dBA for the maximum volume of the pushbutton locator tone during the pedestrian change interval and to require that the loudspeaker be mounted at the far end of the crosswalk at a height of 7 to 10 feet above the pavement. FHWA proposes this change to be consistent with existing provisions for accessible pedestrian signals in Section 4E.11, which are based on “NCHRP 3–62 Accessible Pedestrian Signals: A Guide to Best Practices.”⁹¹

Further, FHWA proposes to add a new Guidance paragraph recommending that the audible beaconing loudspeaker at the far end of the crosswalk should be within the width of the crosswalk.

In addition, FHWA proposes to add an Option to permit the sound level of the accessible pedestrian signal walk indication and subsequent pushbutton locator tone to be increased by an extended pushbutton press.

FHWA proposes these changes to improve accessible pedestrian signals for pedestrians with vision disabilities.

432. FHWA proposes to add a new Chapter numbered and titled, “Chapter 4L Rectangular Rapid-Flashing Beacons” (RRFBs) that includes three new sections and provisions for the application, design, and operation of rectangular rapid flashing beacons used

to supplement pedestrian warning signs. RRFBs consist of two rapidly-flashed rectangular-shaped yellow indications, each with an LED-array based pulsing light source. The proposed provisions are based on the Interim Approval 21,⁹² a research study⁹³ performed on the effectiveness of various flash patterns, and FHWA official interpretations⁹⁴ and experimentations. One notable revision from the IA–22 is a new Standard requiring the design of the RRFBs to conform to the requirements for post-mounted or overhead placement described in paragraph 3 of Section 4L.02 if used at intersections. RRFBs have been shown to achieve high rates of compliance at a low relative cost in comparison to other more restrictive devices that provide comparable results, and they have been shown to provide an enhanced level of pedestrian safety at uncontrolled crosswalks that has been previously unattainable without costly and delay-producing full traffic signalization.

FHWA proposes to add a Guidance statement in Section 4L.02 to recommend the use of audible information devices with RRFBs to

⁹² FHWA’s Interim Approval IA–21, March 20, 2018, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interim_approval/ia21/index.htm.

⁹³ “Driver-Yielding Results for Three Rectangular Rapid-Flash Patterns—Overview,” TTI, June 18, 2014, can be viewed at the following internet website: <http://tti.tamu.edu/2014/06/18/new-rapid-flash-beacon/>. “Driver-Yielding Results for Three Rectangular Rapid-Flash Patterns—Executive Summary,” TTI, June 17, 2014, can be viewed at the following internet website: <https://static.tti.tamu.edu/tti.tamu.edu/documents/TTI-2014-5.pdf>.

⁹⁴ FHWA’s Official Ruling No. 4–376 (I), December 9, 2009, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_376.htm. FHWA’s Official Ruling No. 4(09)–5 (I), August 12, 2010, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_5.htm. FHWA’s Official Ruling No. 4(09)–17 (I), January 9, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_17.htm. FHWA’s Official Ruling No. 4(09)–21 (I), June 13, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_21.htm. FHWA’s Official Ruling No. 4(09)–22 (I), August 8, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_22.htm. FHWA’s Official Ruling No. 4(09)–24 (I), September 27, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_24.htm. FHWA’s Official Ruling No. 4(09)–37 (I), October 9, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_37.htm. FHWA’s Official Ruling No. 4(09)–38 (I), October 22, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_38.htm. FHWA’s Official Ruling No. 4(09)–41 (I), July 25, 2014, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_41.htm.

assist pedestrians with vision disabilities. FHWA proposes this revision to provide additional assistance due to the lack of audible traffic cues.

433. In Section 4M.03 (existing Section 4G.03) Operation of Emergency-Vehicle Traffic Control Signals, FHWA proposes to change P3 and P4 from Standard to Guidance to provide agencies additional flexibility in the operation of emergency-vehicle traffic control signals and warning beacons.

434. In new “Section 4N.03 Operation of Emergency-Vehicle Hybrid Beacons,” consisting of paragraphs from existing Section 4G.04, FHWA proposes to add a Standard requiring the beacon faces to display flashing yellow signal indications to each approach on the major street if placed into flashing mode by a conflict monitor or manual switch. FHWA proposes this change for consistency with requirements for traffic control signals.

In addition, FHWA proposes to add an Option to allow an emergency-vehicle hybrid beacon in close proximity to an active grade crossing to be preempted.

435. In Section 4P.02 (existing Section 4I.02) Design of Freeway Entrance Ramp Control Signals, FHWA proposes to reorder the paragraphs and revise existing P3 to clarify that a minimum of two signal faces shall be provided on ramps that have one controlled lane as well as ramps that have more than one controlled lane and the ramp control signals are operated such that green signal indications are always displayed simultaneously to all of the controlled lanes on the ramp.

For locations where there is more than one lane on an entrance ramp and the ramp control signals are not operated such that the green signal indications are always displayed simultaneously, FHWA proposes to split the requirements between two-lane entrance ramps and entrance ramps with three or more lanes. For two-lane entrance ramps that are separately controlled, at least two ramp control signals shall be provided for each lane. For three or more entrance ramp lanes that are separately controlled, one ramp control signal shall be provided over the approximate center of each lane. FHWA proposes these changes in accordance with Official Ruling No. 4(09)–6(I).⁹⁵

FHWA also proposes a new Option to expand the existing exception to the requirement of 8-foot minimum lateral separation of signal faces for one-lane

⁹⁵ FHWA’s Official Ruling No. 4(09)–6(I), January 5, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_6.htm.

⁹⁰ FHWA’s Official Ruling No. 4(09)–26(I), January 25, 2013, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_26.htm.

⁹¹ NCHRP Web-Only Document 117A can be viewed at the following internet website: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_w117a.pdf.

entrance ramps to apply to entrance ramps with two or more controlled lanes. FHWA proposes this change for consistency with single-lane ramps.

Further, FHWA proposes to change P6 from Standard to Guidance to provide agencies additional flexibility in the location and design of ramp control signals.

436. In Section 4P.03 (existing 4L.03) Operation of Freeway Entrance Ramp Control Signals, FHWA proposes to revise Standard P3 to prohibit the use of flashing light emitting diode (LED) units within the legend or border of signs to inform road users that ramp control signal is in operation. FHWA also proposes similar revisions to Section 4S.03 (existing Section 4L.03) Warning Beacon and Section 4S.04 (existing Section 4L.04) Speed Limit Sign Beacon to prohibit the use of flashing LED units within the legend or border of signs to inform road users that a regulation is in effect or that a condition is present. FHWA believes that warning beacons should be used to inform road users that a regulation is in effect and that flashing LED lights within the border or legend of the sign should only provide added conspicuity to sign legends.

437. In Section 4Q.02 (existing Section 4J.02) Design and Location of Movable Bridge Signals and Gates, FHWA proposes to change P9, the last sentence of P13, P16, and P20 from Standard to Guidance and change P12 from Standard to Support to provide agencies with more flexibility in the design of movable bridge signals, gates, and signs.

438. In Section 4S.01 (existing Section 4L.01) General Design and Operation of Flashing Beacons, FHWA proposes to revise Standard P4 to discontinue the existing allowance of a beacon within the border of a sign for School Speed Limit Sign Beacons. FHWA proposes this change because under certain light and weather conditions, the flashing beacon causes irradiation that can obscure the sign message if the beacon is within the sign or too close to the sign legend. This proposal is consistent with research demonstrating the phenomenon of irradiation or disability glare.⁹⁶ FHWA also proposes a corresponding revision to Section 4S.04 (existing Section 4L.04) Speed Limit Sign Beacon.

FHWA also proposes to add Interchange Exit Direction signs with advisory speed panels as an exception to the Standard prohibiting flashing

beacons within the border of the sign. FHWA proposes this revision to clarify the existing practice and for consistency with Figure 2E–27.

FHWA also proposes to add a new Standard establishing eight-inch and twelve-inch as the two nominal diameter sizes for flashing beacon signal indications in accordance with Official Ruling No. 4(09)–7(I).⁹⁷

439. In Section 4S.02 (existing Section 4L.02) Intersection Control Beacon, FHWA proposes to add a new Standard requiring twelve-inch signal indications for Intersection Control Beacons facing approaches where road users view both flashing beacon indications and lane-use control signal indications simultaneously or where the nearest flashing beacon signal face is more than 120 feet beyond the stop line, unless a supplemental near-side flashing beacon signal face is provided. FHWA also proposes a new Guidance recommending twelve-inch signal indications for Intersection Control Beacons facing approaches where the speed is 40 mph or higher or where post-mounted flashing beacon signal faces are used. FHWA proposes these changes to increase the signal indication visibility for the road users and for consistency with provisions for traffic control signals.

440. In Section 4S.03 (existing Section 4L.03) Warning Beacon, FHWA proposes to delete P5 requiring a minimum of 15 feet and a maximum of 19 feet clearance above the pavement for warning beacons suspended over the roadway. FHWA proposes this change because P2 in new Section 4S.01 adequately addresses clearances and in accordance with Official Ruling No. 4(09)–11(I).⁹⁸

FHWA also proposes to modify P11 to specify that the BE PREPARED TO STOP (W3–4) sign and a WHEN FLASHING (W16–13P) plaque is the traffic signal warning sign assembly that may be used with the Warning Beacon interconnected with a traffic signal controller.

FHWA also proposes to add a Guidance statement to recommend the use of audible information devices with pedestrian-actuated Warning Beacons to assist pedestrians with visual disabilities. FHWA proposes this revision to provide additional assistance

due to the potential lack of audible traffic cues.

FHWA proposes adding a new Standard prohibiting the use of vibrotactile and percussive indications in conjunction with audible information devices at pedestrian-actuated Warning Beacons at a pedestrian crossing. FHWA also proposes a new Guidance recommending that, if used, the audible message should be a speech message that says, “Yellow lights are flashing” and should be spoken twice. FHWA proposes these changes because the vibrotactile and percussive indications are reserved for the Walk indication.

441. In Section 4S.04 (existing Section 4L.04) Speed Limit Sign Beacon, FHWA proposes to delete the second sentence of P2 to provide agencies more flexibility in arranging two or more indications.

FHWA also proposes to modify P3 to expand the provision beyond two signal indications to address situations where four signal indications are used.

442. In Section 4S.05 (existing Section 4L.05) Stop Beacon, FHWA proposes to change P3 from Standard to Guidance to provide agencies flexibility in designing and installing the Stop Beacon with the Stop, Do Not Enter, and Wrong Way signs.

443. In Section 4T.01 (existing Section 4M.01) Application of Lane-Use Control Signals, FHWA proposes to add a new Option allowing the use of a USE LANE(S) WITH GREEN ARROW (R10–8) sign in conjunction with lane-use control signals, for consistency with Section 2B.62 (existing Section 2B.53).

444. In Section 4T.03 (existing Section 4M.03) Design of Lane-Use Control Signals, FHWA proposes to change P6 through P10 from Standard to Guidance to provide agencies flexibility in the design of lane-use control signals.

445. In Section 4T.04 (existing Section 4M.04) Operation of Lane-Use Control Signals, FHWA proposes to change the second sentence of P3 from Standard to Guidance to allow agencies flexibility in the duration of the Red X signal indication display.

446. In Section 4U.01 (existing Section 4N.01), retitled, “Application of In-Roadway Warning Lights,” FHWA proposes to relocate and change P3 from Standard to Guidance to provide agencies additional flexibility in designing the height above the roadway surface of in-roadway warning lights.

447. In Section 4U.02 (existing Section 4N.02) In-Roadway Warning Lights at Crosswalks, FHWA proposes to add a Guidance statement recommending audible information devices be used with In-Roadway Warning Lights to provide assistance for

⁹⁶ Information on the concept of irradiation and disability glare can be viewed at the following internet website: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1444-0938.2003.tb03080.x>.

⁹⁷ FHWA’s Official Ruling No. 4(09)–7(I), February 8, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/4_09_7.htm.

⁹⁸ FHWA’s Official Ruling No. 4(09)–11(I), June 29, 2011, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/4_09_11.htm.

pedestrians with visual disabilities. FHWA proposes this revision to provide additional assistance due to the potential lack of audible traffic cues.

FHWA also proposes a new Standard prohibiting the use of vibrotactile and percussive indications in conjunction with audible information devices at In-Roadway Warning Lights. FHWA also proposes new Guidance recommending that, if used, the audible message should be a speech message that says, "Yellow lights are flashing" and should be spoken twice. FHWA proposes these changes because the vibrotactile and percussive indications are reserved for the Walk indication and pedestrians with vision disabilities could misinterpret the device as an accessible pedestrian signal.

Discussion of Proposed New Part 5 Automated Vehicles

448. As part of the relocation of material related to low-volume roads to other parts within the Manual, FHWA proposes to provide content and retitle Part 5 Automated Vehicles. FHWA proposes all new content for this part. 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 automated vehicle (AV) technologies, and to support the safe deployment of AVs.

449. FHWA proposes a new "Section 5A.01 Purpose and Scope" which contains a Support statement with general information about AV technologies, the MUTCD, and the purpose of the new part.

450. In new "Section 5A.02 Overview of Connected and Automated Vehicles," FHWA proposes to include a Support statement describing various types of AV technology and sensors used by AVs.

451. In new "Section 5A.03 Definition of Terms," FHWA proposes to include a Support statement with several definitions for terms used extensively in AV technology. The definitions proposed are summarized from those found in the Society of Automotive Engineers Standard SAE J3016.⁹⁹ The proposed terms include: Automated Driving Systems, Advanced Driver Assistance Systems, Automation Levels, Cooperative Automation, Driving Automation Systems (DAS), Dynamic Driving Task, and Operational Design Domain.

452. In new "Section 5A.04 Traffic Control Device and Use

Considerations," FHWA proposes a Support statement that describes the challenges related to the interaction between traffic control devices and DAS.

FHWA also proposes to include a Guidance statement recommending agencies adopt maintenance policies or practices that consider both the human vehicle operator and DAS technology needs, and to use engineering judgment to determine traffic control device selection and placement with similar consideration.

FHWA also proposes Support and Guidance statements regarding the fundamental principles and considerations to be applied in evaluating traffic control devices and other maintenance to support of AV technologies during maintenance and infrastructure improvements.

453. FHWA proposes a new chapter titled, "Chapter 5B Provisions for Traffic Control Devices" with sections regarding signs, markings, traffic signals, and temporary traffic control, as well as provisions for traffic control at railroad and light rail transit grade crossings, and traffic control for bicycle facilities.

454. In new "Section 5B.01 Signs," FHWA proposes to include Support and Guidance statements regarding signs. In the Guidance statement, FHWA recommends that signs be clearly associated to the specific lane/road to which they apply, such as parallel roads with different speed limits and that information spreading practices be employed to minimize informational load. FHWA also proposes that standard sign designs be retained as much as possible. Finally, FHWA proposes that the illuminated portion of electronic signs should have a standard refresh/flicker rate, greater than 200 Hz. FHWA proposes this language to accommodate machine vision technology, while also helping human drivers.

455. In new "Section 5B.02 Markings," FHWA proposes to include Support and Guidance statements with a list of considerations that should be used to accommodate machine vision used to support the automation of vehicles and benefit the performance of the human vehicle operator. Most of these considerations are addressed in more detail in Part 3 and references are provided to the primary Sections. These considerations include uniform line widths, the use of dotted edge line extensions along all entrance and exit ramps, along all auxiliary lanes, and along all tapers where a deceleration or auxiliary lane is added, use of chevron markings in exit gore areas, continuous markings in work zones and in all lane

transitions, and minimum dimensions for dashed lines. FHWA also proposes to recommend that raised pavement markers not be used as a substitute for markings and that decorative elements in crosswalks be avoided to minimize any potential confusion for automated systems.

456. In new "Section 5B.03 Highway Traffic Signals," FHWA proposes to include a Guidance statement with a list of considerations that should be used to accommodate machine vision used to support the automation of vehicles and benefit the performance of the human vehicle operator. The list includes consistency along a corridor of traffic signal design and placement with respect to approach lanes, and consistent LED refresh rates greater than 200 Hz.

In concert with this change, FHWA proposes a Support statement describing the challenges in achieving corridor-based consistency necessary for machine vision. Information is provided on the benefits of using vehicle-to-infrastructure (V2I) technology for traffic signal systems to address inconsistencies in a corridor.

457. In new "Section 5B.04 Temporary Traffic Control," FHWA proposes Guidance and Standard statements regarding the use of signs and pavement markings to accommodate machine vision better and benefit the performance of the human vehicle operator in and through work zones. FHWA proposes that type of signs, spacing, and mounting height should follow the requirements in Part 6 and that the END ROAD WORK sign should be used to establish the end of the work zone.

In the Standard, FHWA proposes existing pavement markings be maintained in all long-term stationary temporary traffic control zones in accordance with other referenced areas of the Manual. FHWA also proposes pavement markings match the alignment of the markings in place at both ends of the Temporary Traffic Control (TTC) zone and that they be placed along the entire length of any paved detour or temporary roadway prior to the detour or roadway being opened to road users. FHWA also proposes pavement markings in the temporary traveled way that are no longer applicable be removed or obliterated as soon as practical. As part of this requirement, FHWA proposes that pavement marking obliteration remove the non-applicable pavement marking material, the obliteration method minimize pavement scarring, and painting over existing pavement markings with black paint or spraying

⁹⁹The Society of Automotive Engineers' Standard SAE J3016 can be viewed at the following internet website: <https://www.sae.org/news/2019/01/sae-updates-j3016-automated-driving-graphic>.

with asphalt shall not be accepted as a substitute for removal or obliteration. FHWA proposes these changes to accommodate machine vision of AVs, which might not have the capabilities to distinguish between markings that appear to conflict with one another in the same way that a human road user can.

Finally, FHWA proposes a Guidance statement to recommend provisions to enhance the visibility of vertical panels, tubes, and other channelizing devices, as well as markings, to accommodate machine vision as well as human vehicle operators.

458. In new “Section 5B.05 Traffic Control for Railroad and Light Rail Transit Grade Crossings,” FHWA proposes a Guidance statement recommending that placement of signs and markings be consistent within a corridor at both passive and active highway-rail grade crossings. In addition, FHWA proposes Guidance recommending that V2I communication be employed at a highway-rail grade crossing. Finally, FHWA proposes a Support statement recommending signs and pavement marking associated with railroad crossings and tracks that are no longer active be removed. FHWA proposes this language to accommodate machine vision better and benefit the performance of the human vehicle operator.

459. In new “Section 5B.06 Traffic Control for Bicycle Facilities,” FHWA proposes a Guidance statement recommending that bicycle facilities be segregated from other vehicle traffic using physical barriers where practicable and that road markings are needed to denote the end of a bike lane that is merged with traffic. FHWA proposes this language to accommodate machine vision better and benefit the performance of the human vehicle operator.

460. FHWA proposes to reserve Chapter 5C for potential future provisions.

Discussion of Proposed Amendments to Part 6 Temporary Traffic Control

461. FHWA proposes to reorganize Part 6 by dividing some existing long chapters and sections into several chapters and/or several sections, each having a clearly understandable title, and by moving certain material to new locations within Part 6 to consolidate similar information in one place. In some cases, this involves the proposed creation of new Chapters and Sections that do not exist in the 2009 MUTCD. FHWA believes this proposed reorganization would create a more logical flow of information and make it

easier for users to find the content they need. In addition, FHWA proposes to delete text from various sections where such material duplicates or is very similar to existing text in other sections within Part 6 or elsewhere in the MUTCD. These reorganizations and elimination of redundancies are editorial in nature and do not significantly change the technical content or meaning, except as otherwise discussed below.

462. Throughout Part 6, FHWA proposes to make various editorial revisions to eliminate the use of unacceptably vague and undefined terms, such as “reasonably safe,” replacing such phrases with more appropriate language.

463. FHWA is proposing to revise several Guidance statements related to sidewalk closure during construction and accessible pedestrian access. Under Title II of the Americans with Disabilities Act (ADA), all State and local governments are required to take appropriate steps to ensure that their communications with people with disabilities are as effective as communications with others. [28 CFR 35.160(a)]. Effective communication means that whatever information is conveyed by or on behalf of a public entity must be as clear and understandable to people with disabilities as it is for people who do not have disabilities. The ADA requires public entities to furnish auxiliary aids and services—which include the acquisition or modification of equipment or devices—where necessary to afford individuals with disabilities an equal opportunity to participate in, and enjoy the benefits of, a service, program, or activity of a public entity. [28 CFR 35.160(b)(1)]. The provision of pedestrian facilities in the public right-of-way is generally recognized as a service provided by the public entity that owns such facilities. *See, e.g., Barden v. City of Sacramento*, 292 F.3d 1073 (9th Cir. 2002). When sidewalks are closed temporarily due to construction, it is important for the closure to be communicated to pedestrians in a manner that is accessible to pedestrians with vision loss. FHWA proposes to strengthen the language in Part 6 to address this need.

Under Title II of the ADA, all State and local governments must operate services, programs, and activities, including pedestrian facilities in public street rights-of-way, such that, when viewed in their entirety, they are readily accessible to and usable by individuals with disabilities. The ADA requires that a public entity’s newly constructed facilities be made accessible to and

usable by individuals with disabilities to the extent that it is not structurally impracticable to do so. The ADA also requires that, when an existing facility is altered, the altered facility be made accessible and usable by individuals with disabilities to the maximum extent feasible. Section 504 of the Rehabilitation Act of 1973, generally referred to as Section 504, includes similar requirements for public entities that receive Federal financial assistance. FHWA proposes to eliminate text that refers to a level of usage by pedestrians with disabilities as a basis for taking certain accessibility-related actions because the need to comply with the ADA does not depend on the frequency with which the facility is used by pedestrians with disabilities. FHWA also proposes to eliminate text suggesting that the accommodation of pedestrians with disabilities is sometimes unnecessary.

464. In conjunction with the elimination of existing Part 5 Low-Volume Rural Roads, FHWA proposes to add a new Support paragraph in Section 6A.01 General regarding temporary traffic controls on low-volume rural roads. FHWA also proposes to change the last two sentences of existing P10 from Standard to Guidance, to make this information regarding statutory authority to be consistent with similar information in Part 1.

465. In Section 6A.02 (existing Section 6B.01) Fundamental Principles of Temporary Traffic Control, FHWA proposes to add information on the spacing and number of signs in the advance warning area in order to address excessive queue lengths based on the findings of NTSB/HAR-15/02 Multivehicle Work Zone Crash I-95 Cranbury, New Jersey.¹⁰⁰ FHWA proposes to clarify the language in the Guidance statement of paragraph 7 parts 3A and 3B pertaining to pedestrian accessibility in accordance with 28 CFR 35.160(a)(1), which requires a public entity 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.

466. FHWA proposes to divide existing Section 6F.01 Types of TTC Devices into two new sections, 6A.03 “TTC Devices” and 6A.04 “Crashworthiness of TTC Devices.” FHWA proposes to revise the Standard

¹⁰⁰ “Multivehicle Work Zone Crash on Interstate 95, Cranbury, New Jersey, June 7, 2014,” NTSB/HAR-15/02, can be viewed at the following internet website: <https://ntsb.gov/investigations/AccidentReports/Pages/har1502.aspx>.

paragraph in new Section 6A.03 defining “traffic control devices” and the Support paragraph in Section 6A.04 regarding crashworthiness to be consistent with the revised definitions proposed for these terms in Part 1.

467. In Section 6B.01 (existing Section 6C.01) Temporary Traffic Control Plans, FHWA proposes to add a Guidance statement recommending the development of a TTC plan for any activity, either planned or unplanned, that will affect road users, because TTC plans for such activities are an important element of roadway safety. In addition, FHWA proposes to delete the last three sentences of the Guidance paragraph about pedestrians with disabilities because this information is covered elsewhere in Part 6.

468. In Section 6B.04 (existing Section 6C.04) Advance Warning Area, FHWA proposes to change the second sentence in P4 from Guidance to Option to clarify the intent of the language. FHWA proposes this change to provide flexibility for cases such as low-speed residential streets.

469. In Section 6B.05 (existing Section 6C.05) Transition Area, FHWA proposes to clarify the intent of the Standard Statement by adding that signs, arrow boards, and/or channelizing devices are the appropriate devices for directing road users from the normal path to a new path, except in the case of short-term mobile operations.

470. In Section 6B.08 (existing Section 6C.08) Tapers, FHWA proposes to delete the first sentence of Guidance P15, because the use of flaggers or temporary traffic control signals is covered elsewhere.

471. In Section 6C.02 (existing Section 6D.01) Pedestrian Considerations, FHWA proposes to edit and change existing P3 from Standard to Guidance because advance notification of a sidewalk closing is not always possible, especially in emergencies, therefore it is not appropriate to require advance notification. FHWA also proposes to delete the second sentence of existing P4 regarding adequate pedestrian access in TTC zones to eliminate repetition with Section 6B.03 (existing Section 6C.03). In addition, FHWA proposes to add an Option statement about accommodating pedestrians if a short-term work zone is attended by project personnel, in order to provide more flexibility while maintaining pedestrian safety and convenience. FHWA also proposes to add a Guidance statement to recommend designing TTC zones to minimize conflicts between vehicular and pedestrian movements due to the likelihood of high pedestrian presence

in roadways open to public travel to enhance pedestrian safety. FHWA further proposes to delete the existing second sentence of P22 about the upstream leading ends of temporary traffic barrier because this information is adequately covered in Section 6M.02 (existing Section 6F.85).

472. In Section 6C.03 (existing Section 6D.02) Accessibility Consideration, FHWA proposes to eliminate the first portion of the second sentence in existing paragraph 3 that refers to a level of usage by pedestrians with disabilities as a basis for taking certain accessibility-related actions because the need to comply with the Americans with Disabilities Act does not depend on the frequency with which the facility is used by pedestrians with disabilities.

473. In Section 6C.05 (existing Section 6E.02) High-Visibility Safety Apparel, FHWA proposes to update the text to reflect the latest ANSI Standard 107 dated 2015, per Official Ruling Nos. 6(09)–2(I),¹⁰¹ 6(09)–4(I),¹⁰² 6(09)–12(I),¹⁰³ and 6(09)–37(I),¹⁰⁴ and in concert with these changes proposes to delete repetitive information covered by the ANSI standard.

474. In Section 6D.02 STOP/SLOW Paddle for Hand-Signaling, FHWA proposes to delete the second, third, and fourth sentences of the Standard regarding the design details of this device, because those details are standardized and must comply with the existing provisions of Chapter 2A. FHWA also proposes to add an Option to allow the use of a STOP/STOP or SLOW/SLOW paddle in certain situations where appropriate, to provide additional flexibility.

475. In proposed Section 6D.03 Flag for Hand-Signaling, FHWA proposes to incorporate information about the color of flags to allow an alternate color of fluorescent orange-red based on Official Ruling No. 6(09)–1(I)¹⁰⁵ to provide flexibility during emergency situations.

¹⁰¹ FHWA’s Official Ruling No. 6(09)–2(I), April 1, 2010, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_002.htm.

¹⁰² FHWA’s Official Ruling No. 6(09)–4(I), May 10, 2010, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_004.htm.

¹⁰³ FHWA’s Official Ruling No. 6(09)–12(I), February 1, 2012, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_12.htm.

¹⁰⁴ FHWA’s Official Ruling No. 6(09)–37(I), June 1, 2016, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_37.htm.

¹⁰⁵ FHWA’s Official Ruling No. 6(09)–1(I), March 10, 2010, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_001.htm.

476. In Section 6D.05 (existing Section 6E.07) Flagger Procedures, FHWA proposes to revise P2 to reflect Official Ruling No. 6(09)–16(I)¹⁰⁶ related to the use of hand movements alone by uniformed law enforcement officers to control road users approaching a TTC zone. FHWA also proposes further revisions to P2 that are intended to allow hand movements alone by uniformed law enforcement officers when directing traffic at special events. FHWA proposes to add an Option to allow the use of a STOP/STOP or SLOW/SLOW paddle in certain situations where appropriate, consistent with a similar proposed Option in Section 6D.02.

477. In Section 6D.06 (existing Section 6E.08) Flagger Stations, FHWA proposes to change P1 from Standard to Guidance, since the required flagger station location may not be achievable in some geometric conditions and signing would have to be relied upon.

478. In Section 6E.04 (existing Section 6C.13) Pilot Car Method, FHWA proposes to revise the Standard statement to allow mounting of the sign on top of the pilot vehicle as well as on the rear, and to clarify that pilot car operations shall be coordinated with flagging or other control methods, as this is necessary for safety. FHWA also proposes to add a new Standard to require a flagger to operate an Automated Flagger Assistance Device (AFAD) in pilot car operations based on Official Ruling No. 6(09)–15(I)¹⁰⁷ to clarify that an AFAD is not a temporary traffic control signal and should not be operated in an automatic manner.

479. In conjunction with the elimination of existing Part 5 Low-Volume Rural Roads, FHWA proposes to revise P9 of Section 6F.01 (existing Section 6F.02) General Characteristics of TTC Zone Signs, to integrate information about low-volume rural roads and to reduce the speed below which minimum sign sizes can be used from 35 mph to 30 mph. FHWA proposes to change P10 of this Section from Standard to Guidance because there may be cases where it is necessary to deviate from standard sign sizes in increments other than in 6-inches. FHWA proposes to remove the requirement in P14 for sign material to have a smooth, sealed outer surface,

¹⁰⁶ FHWA’s Official Ruling No. 6(09)–16(I), September 20, 2012, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_16.htm.

¹⁰⁷ FHWA’s Official Ruling No. 6(09)–15(I), September 19, 2012, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_15.htm.

since such requirement is not appropriate for the MUTCD.

480. In Section 6F.02 (existing Section 6F.03) Sign Placement, FHWA proposes to remove the support statement of existing paragraph 18 because NCHRP Report 350 is no longer a valid method of determining crashworthiness.

481. In Section 6G.07 (existing Section 6F.11) STAY IN LANE Signs (R4–9, R4–9a), FHWA proposes the STAY IN LANE TO MERGE POINT (R4–9a) sign to support the Late Merge option in Section 6N.19.

482. In Section 6G.10 (existing Section 6F.14) SIDEWALK CLOSED Signs (R9–9, R9–10, R9–11, R9–11a), FHWA proposes to delete the last sentence in the support statement of existing paragraph 6 because it contradicts the Standard in 6C.03 Accessibility Considerations.

483. FHWA proposes to add a new Section 6G.11 Turn Off 2-Way Radio and Cellphone (R22–2) Sign and relocate the information about this sign (which is currently numbered W22–2) from existing Section 6F.42 to this new section, because the sign conveys a regulatory message rather than a warning message.

484. In Section 6H.01 (existing Section 6F.16) Warning Sign Function, Design, and Application, FHWA proposes to change the last phrase of existing P2 (new P3) regarding fluorescent yellow-green backgrounds from Standard to Option to be consistent with Part 2.

485. In Section 6H.03 (existing Section 6F.18) ROAD (STREET) WORK Sign (W20–1), FHWA proposes to change P3 from Standard to Option because the primary legend is specified in the “Standard Highway Signs” publication, and the allowable alternate legends are covered by the new Option.

486. In Section 6H.04 (existing Section 6F.19) DETOUR Sign (W20–2), FHWA proposes to change P2 from Standard to Option because the primary legend is specified in the “Standard Highway Signs” publication, and the allowable alternate legends are covered by the new Option.

487. In Section 6H.05 (existing Section 6F.20) ROAD (STREET) CLOSED Sign (W20–3), FHWA proposes to change P2 from Standard to Option because the primary legend is specified in the “Standard Highway Signs” publication, and the allowable alternate legends are covered by the new Option.

488. In Section 6H.06 (existing Section 6F.21) ONE LANE ROAD Sign (W20–4), FHWA proposes to change the second sentence of P2 from Standard to Option because the primary legend is specified in the “Standard Highway

Signs” publication, and the allowable alternate legends are covered by the new Option.

489. In Section 6H.07, retitled, (existing Section 6F.22) “Lane(s) Closed Signs (W20–5, W20–5a, and W9–3),” FHWA proposes to change part of P2 from Standard to Option because the allowable alternate legends are covered by the new Option. FHWA also proposes to combine existing Section 6F.23 The CENTER LANE CLOSED AHEAD (W9–3) sign into this section since Section 6H.07 includes all the other lane closure signs.

490. In Section 6H.08 (existing Section 6F.24) Lane Ends (W4–2, W9–2a) signs, FHWA proposes the Merge Here Take Turns (W9–2a) sign to identify the merge point and to take turns merging during Late Merge applications.

491. In Section 6H.24 (existing Section 6F.39) UTILITY WORK Sign (W21–7), FHWA proposes to change P3 from Standard to Option because the primary legend is specified in the “Standard Highway Signs” publication, and the allowable alternate legends are covered by the new Option.

492. In Section 6H.25 (existing Section 6F.40) Signs for Blasting Areas, FHWA proposes to consolidate existing Sections 6F.40 thru 6F.43 since they all relate to signs in blasting areas. FHWA also proposes to revise P2 to reflect the change of the W22–2 sign to a regulatory sign because the sign is requiring an action and not warning about a hazard.

493. In Section 6J.01 (existing Section 6F.77) Pavement Markings in TTC Zones, FHWA proposes to change the first two sentences of P4 from Standard to Guidance, because “as soon as practical” is not defined and obliteration of pavement markings cannot always be complete and without significant scarring.

494. In Section 6J.03 (existing Section 6F.79) Temporary Raised Pavement Markers, FHWA proposes to revise the required spacing for temporary raised pavement markers in P3 and P4 to simplify layout in the field by providing specific distances rather than equations.

495. In Section 6K.01 (existing Section 6F.63) Channelizing Devices—General, FHWA proposes to add P10 and revise P12 to reflect changes associated with Official Ruling No. 6(09)–11(I).¹⁰⁸ Also, FHWA proposes to change existing P18 from a Standard to

a Guidance statement because “significant amount” is not defined.

496. FHWA proposes to create a new section numbered and titled, “Section 6K.02 Pedestrian Channeling Devices” that contains information relocated from existing Section 6F.63 plus new Standard, Guidance, Option, and Support information specific to pedestrian channelizing devices. Within this new section, FHWA proposes to add a new figure, Figure 6K–2, illustrating an example of a pedestrian channelizing device, including hand-trailing for visually-disabled pedestrians.

497. In Section 6K.07 (existing Section 6F.68) Type 1, 2, or 3 Barricades, FHWA proposes to change the second sentence of P22 from Standard to Guidance, because “adequate” is not defined and cannot be achieved in all geometric conditions.

498. FHWA proposes to revise Section 6K.11 (existing Section 6F.72) Temporary Lane Separators, to reflect the intended use of these devices more accurately. FHWA proposes to revise the two Standard statements and to add a new Guidance statement to clarify the design if these devices and to indicate that temporary lane separators should not be used to shield obstacles or provide positive protection for workers for pedestrians. FHWA also proposes to revise P5 to reflect the intentional movement of temporary lane separators in a TTC zone per Official Ruling No. 6(09)–14(I).¹⁰⁹

499. FHWA proposes to revise Section 6L.01 (existing Section 6F.84) Temporary Traffic Control Signals to conform to proposed changes in Section 4K.01.

500. In Section 6L.03 (existing Section 6E.05) STOP/SLOW Automated Flagger Assistance Devices, FHWA proposes to add an Option for use of a new WAIT ON STOP–GO ON SLOW sign combining the messages of the two existing signs, to provide additional flexibility.

501. In Section 6L.05 (existing Section 6F.60) Portable Changeable Message Signs, FHWA proposes to revise P19 regarding the use of portable changeable message signs to simulate an Arrow Board display, per Official Ruling No. 6(09)–18(I).¹¹⁰

502. In Section 6L.07 (existing Section 6F.83), retitled, “Flashing Beacons and

¹⁰⁸ FHWA’s Official Ruling No. 6(09)–11(I), January 3, 2012, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_11.htm.

¹⁰⁹ FHWA’s Official Ruling No. 6(09)–14(I), August 8, 2012, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_14.htm.

¹¹⁰ FHWA’s Official Ruling No. 6(09)–18(I), December 4, 2012, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_18.htm.

Warning Lights,” FHWA proposes to relocate a portion of Standard P11 from existing Section 6F.63 pertaining to the use of flashing warning lights in order to place this information in the appropriate section. FHWA also proposes to revise existing P9 to clarify that the only allowable use of a series of sequential flashing warning lights is on channelized devices that form a merging taper.

503. FHWA proposes to add a new Section 6M.01 General, consisting of a Support statement to introduce the proposed new Chapter 6M, in which is grouped the existing information concerning TTC zone design features and devices that are not traffic control devices.

504. In Section 6M.02 (existing Section 6F.85) Positive Protection and Temporary Traffic Barriers, FHWA proposes to change P4 from Guidance to Standard to improve worker safety within the work zone.

FHWA also proposes to revise existing P8 and delete P9 and P10 to broaden the description of movable barriers.

505. In Section 6M.04 (existing Section 6F.74) Detectable Edging for Pedestrians, FHWA proposes to eliminate the first portion of the first sentence in P2 that refers to a level of usage by pedestrians with disabilities as a basis for taking certain accessibility-related actions because the need to comply with the Americans with Disabilities Act does not depend on the frequency with which the facility is used by pedestrians with disabilities and to correct the edging distance in the second sentence of existing P2 from 6 inches to 8 inches to be consistent with new Section 6K.02

506. In Section 6M.05 (existing Section 6F.86) Crash Cushions, FHWA proposes to delete the last existing Guidance paragraph about use of these devices in accordance with manufacturer’s specifications and instead insert this into P5 as part of the Standard statement, to consolidate information about design and use.

507. FHWA proposes to delete existing Section 6F.81 Lighting Devices, because such devices are not defined. As part of this change, FHWA proposes to relocate two of the existing paragraphs to Sections 6L.07 and 6N.01.510.

508. In Section 6M.08 (existing Section 6F.82) retitled, “Lighting for Night Work,” FHWA proposes to change existing P4 from a Standard to a Guidance statement to reflect the intent to minimize glare caused by floodlighting. FHWA proposes to add two new sentences to existing P5 to

recommend that lighting should be sufficient so as to identify a worker clearly as a person and care should be taken to minimize the potential for shadows to conceal workers within the work area.

509. In Section 6N.01 (existing Section 6G.02) Work Duration, FHWA proposes to change P2 from Standard to Guidance to allow flexibility in the definition of the five categories of work duration at a location.

FHWA also proposes to add a new Support to describe the rolling roadblock method for temporary traffic control based on findings from the NTSB H–17–2 Bus Crash-US 101 San Jose, California.¹¹¹

510. In Section 6N.04 (existing Section 6G.05) Work Affecting Pedestrian and Bicycle Facilities, FHWA proposes to add new Guidance, Support, and Standard statements, to provide additional information for accommodating bicycles through TTC zones.

511. In Section 6N.05 (existing Section 6G.06) Work Outside of the Shoulder, FHWA proposes to revise from Option to Guidance a sentence about the use of a SHOULDER WORK sign if work vehicles are on the shoulder, for enhanced safety.

512. In Section 6N.13 (existing Section 6G.14) Work Within the Traveled Way of a Freeway or Expressway, FHWA proposes to add a new Support on the spacing and number of since in the advance warning area due to excessive queue lengths based on the findings of NTSB/HAR–15/02 Multivehicle Work Zone Crash I–95 Cranbury, New Jersey.

513. In Section 6N.14 (existing Section 6G.15) Two-Lane, Two-Way Traffic on One Roadway of a Normally Divided Highway, FHWA proposes to revise P2 to clarify that Opposing Lane Traffic Divider (W6–4) signs on flexible supports are one of the types of devices that can be used to separate opposing vehicular traffic.

514. FHWA proposes to add Section 6N.19 Late Merge to provide Guidance and Option statements to provide consistency when utilizing the Late Merge concept with lane closures.

515. In Section 6O.01 (existing Section 6I.01) General, FHWA proposes to include an explanation to incorporate estimated time durations in the planning and training initial incident

¹¹¹ “Motorcoach Collision with Crash Attenuator in Gore Area US Highway 101, San Jose, CA,” NTSB Recommendation H–17–002 can be viewed at the following internet website: https://www.nts.gov/investigations/AccidentReports/_layouts/nts.recsearch/Recommendation.aspx?Rec=H-17-002.

estimate. FHWA also proposes to revise P8 to include an explanation of safe positioning of emergency vehicles arriving at an incident. This information is currently included in Part 1 in the definition of the term “safe-positioned” but, as noted previously, the definition is being deleted since the term is only used in Section 6O.01.

516. In Section 6P.01 (existing Section 6H.01) Typical Applications, FHWA proposes to add eight new Typical Application figures along with notes to accompany them. New Figures 6P–47 through 6P–51 illustrate and describe five different situations involving work impacting bicycle facilities, to supplement proposed new text information in Section 6N.04 (existing Section 6G.05). New Figures 6P–52 through 6P–54 illustrate and describe procedures for work at a roundabout. In addition, FHWA proposes to revise the existing drawings and/or notes for the following existing figures in Chapter 6P (existing Chapter 6H):

a. Notes for Figure 6P–3 (existing Figure 6H–3) Work on Shoulders: FHWA proposes to add a new Option note regarding the use of positive protection devices.

b. Notes for Figure 6P–4 (existing Figure 6H–4) Short Duration or Mobile Operation on a Shoulder: FHWA proposes to add a new option note regarding the use of positive protection devices.

c. Notes for Figure 6P–6 (existing Figure 6H–6) Shoulder Work with Minor Encroachment: FHWA proposes to add a new Option note regarding the use of positive protection devices.

d. Notes for Figure 6P–7 (existing Figure 6H–7) Road Closure with a Diversion: FHWA proposes to revise existing note 10 from Option to Guidance, to recommend rather than merely allow the use of delineators along the diversion.

e. Notes for Figure 6P–10 (existing Figure 6H–10) Lane Closure on a Two-Lane Road Using Flaggers: FHWA proposes to add a new Option note regarding the use of positive protection devices.

f. Notes for Figure 6P–11 (existing Figure 6H–11) Lane Closure on a Two-Lane Road with Low Traffic Volumes: FHWA proposes to add a new Option note regarding the use of positive protection devices.

g. Notes for Figure 6P–12 (existing Figure 6H–12) Lane Closure on a Two-Lane Road Using Traffic Control Signals: FHWA proposes to revise Standard note 4 by deleting the requirement to use stop lines for intermediate-term closures, to provide additional flexibility. FHWA also

proposes to add a new Option note regarding the use of positive protection devices.

h. Notes for Figure 6P–13 (existing Figure 6H–13) Temporary Road Closure: FHWA proposes to add a new Option note regarding the use of positive protection devices.

i. Notes for Figure 6P–14 (existing Figure 6H–14) Haul Road Crossing: FHWA proposes to revise Standard note 7a for completeness and clarity, and to add new Standard note 7b and Guidance note 11 pertaining to the use of actuated signal operation per Official Ruling No. 6(09)–7(I).¹¹²

j. Notes for Figure 6P–15 (existing Figure 6H–15) Work in the Center of a Road with Low Traffic Volumes: FHWA proposes to add a new Option note regarding the use of positive protection devices.

k. Notes for Figure 6P–17 (existing Figure 6H–17) Mobile Operations on a Two-Lane Road: FHWA proposes to add a new Option note regarding the use of positive protection devices.

l. Notes for Figure 6P–18 (existing Figure 6H–18) Lane Closure on a Minor Street: FHWA proposes to add a new Option note regarding the use of positive protection devices.

m. Notes for Figure 6P–21 (existing Figure 6H–21) Lane Closure on the Near Side of an Intersection: FHWA proposes to add a new Option note regarding the use of positive protection devices.

n. Figure 6P–22 (existing Figure 6H–22) Right-Hand Lane Closure on the Far Side of an Intersection: FHWA proposes to revise the drawing in this figure to correspond with proposed changes in the notes for the figure as follows. In Option note 2, FHWA proposes to relocate the third sentence to Support for consistency with the notes for other similar figures. FHWA also proposes to add a new Option note regarding the use of continuous channelizers and a new Option note regarding the use of positive protection devices.

o. Notes for Figure 6P–23 (existing Figure 6H–23) Left-Hand Lane Closure on the Far Side of an Intersection: FHWA proposes to add a new Option note regarding the use of positive protection devices.

p. Figure 6P–24 (existing Figure 6H–24) Half Road Closure on the Far Side of an Intersection: FHWA proposes to revise the drawing in this figure to remove the optional temporary markings and also to correspond with the proposed addition of a new Option

note regarding the use of continuous channelizers and a new Option note regarding the use of positive protection devices.

q. Figure 6P–25 (existing Figure 6H–25) Multiple Lane Closures at an Intersection: FHWA proposes to revise the drawing in this figure to correspond with proposed changes in the notes for the figure as follows. FHWA proposes to delete Guidance note 1 regarding placement of a LEFT LANE MUST TURN LEFT sign. FHWA also proposes to add a new Option note regarding the use of positive protection devices.

r. Notes for Figure 6P–27 (existing Figure 6H–27) Closure at the Side of an Intersection: FHWA proposes to add a new Option note regarding the use of positive protection devices.

s. Figure 6P–28 (existing Figure 6H–28) Sidewalk Detour or Diversion: FHWA proposes to revise the drawing in this figure to correspond with the proposed changes in the notes for the figure as follows, to correspond with text changes in new Section 6N.04 (existing Section 6G.05). FHWA proposes to delete existing Standard note 1 and replace it with five new Standard notes. In addition, FHWA proposes to delete existing Guidance note 2 and replace it with two new Guidance notes, and to add one new Option note. FHWA also proposes to change the existing Guidance note 3 to a Standard in order to comply with 28 CFR 35.160(a)(1). These proposed changes are to correct discrepancies between the figure for Sidewalk Diversion and other sections in Part 6.

t. Figure 6P–29 (existing Figure 6H–29) Crosswalk Closures and Pedestrian Detours: FHWA proposes to add two new Standard statements and move the existing Guidance statement 3 to a Standard in order to comply with 28 CFR 35.160(a)(1).

u. Notes for Figure 6P–30 (existing Figure 6H–30) Interior Lane Closure on a Multi-Lane Street: FHWA proposes to add a new Option note regarding the use of positive protection devices.

v. Notes for Figure 6P–31 (existing Figure 6H–31) Lane Closure on a Street with Uneven Directional Volumes: FHWA proposes to add a new Option note regarding the use of positive protection devices.

w. Notes for Figure 6P–32 (existing Figure 6H–32) Half Road Closure on a Multi-Lane, High-Speed Highway: FHWA proposes to add a new Option note regarding the use of positive protection devices.

x. Notes for Figure 6P–33 (existing Figure 6H–33) Stationary Lane Closure on a Divided Highway: FHWA proposes

to add a new Option note regarding the use of positive protection devices.

y. Notes for Figure 6P–35 (existing Figure 6H–35) Mobile Operation on a Multi-Lane Road: FHWA proposes to add a new Option note regarding the use of positive protection devices.

z. Notes for Figure 6P–37 (existing Figure 6H–37) Double Lane Closure on a Freeway: FHWA proposes to add a new Option note regarding the use of positive protection devices.

aa. Notes for Figure 6P–38 (existing Figure 6H–38) Interior Lane Closure on a Freeway: FHWA proposes to delete two Guidance statements regarding visibility of the arrow boards because the statements are not needed and not consistent with the notes of other similar figures. FHWA proposes to add an Option Statement to allow the use of a truck mounted attenuator to improve worker safety. FHWA also proposes to add a new Option note regarding the use of positive protection devices.

bb. Notes for Figure 6P–40 (existing Figure 6H–40) Median Crossover for an Entrance Ramp: FHWA proposes to add a new Option note regarding the use of positive protection devices.

cc. Notes for Figure 6P–41 (existing Figure 6H–41) Median Crossover for an Exit Ramp: FHWA proposes to add a new Option note regarding the use of positive protection devices.

dd. Notes for Figure 6P–42 (existing Figure 6H–42) Work in the Vicinity of an Exit Ramp: FHWA proposes to add a new Option note regarding the use of positive protection devices.

ee. Notes for Figure 6P–43 (existing Figure 6H–43) Partial Exit Ramp Closure: FHWA proposes to add a new Option note regarding the use of positive protection devices.

ff. Notes for Figure 6P–44 (existing Figure 6H–44) Work in the Vicinity of an Entrance Ramp: FHWA proposes to add a new Option note regarding the use of positive protection devices.

gg. Notes for Figure 6P–46 (existing Figure 6H–46) Work in the Vicinity of a Grade Crossing: FHWA proposes to add a new Option note regarding the use of positive protection devices.

Discussion of Proposed Amendments to Part 7 Traffic Control for School Areas

517. As part of the reorganization, FHWA proposes to consolidate Chapter 7A into two sections numbered and titled, “Section 7A.01 Introduction” and “Section 7A.02 School Route Plans and School Crossings.” The two sections consist of provisions from existing Section 7A.01 through Section 7A.04.

518. 520. In Section 7A.01 “Introduction,” FHWA proposes to change existing P1 in Section 7A.04

¹¹² FHWA’s Official Ruling No. 6(09)–7(I), June 1, 2011, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/6_09_7.htm.

from a Standard to Support because the general information in this paragraph describing the scope of Part 7 is more appropriate as a Support statement.

FHWA also proposes to delete existing Support P2–4 and the first sentence of P5 that contain references to other sections, chapters, and parts in the Manual, because this text is unnecessary. The MUTCD users are accustomed to knowing that other areas of the Manual should be consulted when working in Part 7, because school areas include signs, pavement markings, and traffic signals. FHWA retains the reference to the School Crossing signal warrant, because it is specific to school areas.

519. FHWA proposes to delete existing Section 7A.03 School Crossing Criteria. FHWA proposes to delete Support P1, because the information is not needed in the MUTCD, and relocate P2 to Section 7D.01 in order to place information about gaps in traffic with similar information in new Section 7D.01 (existing Section 7D.03).

520. FHWA proposes to consolidate and combine information from existing Sections 7B.01 through 7B.07 into one section numbered and titled, “Section 7B.01 Design of School Signs.” FHWA proposes to delete Standards and Guidance that are covered in Section 2A.11 as the information is redundant.

521. FHWA also proposes to create a new section numbered and titled, “Section 7B.02 School Area Signs and Plaques” using information from existing Sections 7B.08 through Section 7B.10.

FHWA proposes to change Standard P1 in existing Section 7B.10 to Guidance because many States have higher fines by statute in school zones, work zones, and other locations. Retaining this as a Standard may have an unintended consequence of placing a financial burden on States and municipalities to sign for every location where there are increased fines; therefore, FHWA believes that the use of engineering judgment is more appropriate.

FHWA also proposes to add new Guidance, Standard, and Option paragraphs to clarify the application of Higher Fines Signs and Plaques in school areas based on Official Ruling No. 7(09)–3(I).¹¹³

522. FHWA proposes to create a new section numbered and titled, “Section 7B.03 School Crossing Signs” by combining information from existing Sections 7B.11 and Section 7B.12.

FHWA also proposes to change a portion of Standard P3 in existing Section 7B.12 prohibiting the use of School Crossing assemblies on approaches controlled by a YIELD sign to Guidance. FHWA proposes this change to revert back to the language in the 2003 MUTCD. NCUTCD suggested this change because the language in the 2009 Edition that prohibited the use of School Crossing assemblies on approaches controlled by a STOP or a YIELD sign was too restrictive. An NCUTCD task force working on this issue cited that the School Crossing assembly provides beneficial guidance to road users on approaches where vehicles are not required to stop; therefore, prohibiting their use where YIELD signs are placed could have a negative effect on the safety of school children. In conjunction with this change, FHWA proposes two new Options allowing a School Crossing Assembly on Yield approaches to roundabouts and channelized right turn lanes controlled by a Yield sign. Also, FHWA proposes to allow a Yield Here To (Stop Here For) Pedestrians (R1–5a or R1–5c) sign in advance of a marked crosswalk on a multi-lane approach in a school zone in accordance with the provisions in Section 2B.20.

FHWA proposes to change existing Options P4, P5, P6, and existing Standard P8 in existing Section 7B.12 to clarify the application of In-Street Pedestrian Crossing (R1–6 or R1–6a) sign, In-Street School Crossing (R1–6b or R1–6c) sign, Overhead Pedestrian Crossing (R1–9 or R1–9a) sign, and 12-inch reduced size in-street School (S1–1) sign may be used at school crossings on approaches that are not controlled by a traffic control signal, a pedestrian hybrid beacon, or emergency vehicle hybrid beacon. FHWA proposes these changes to eliminate any potential confusion whether the various types of beacons are considered unsignalized intersections.

FHWA proposes to modify the name of the In-Street Schoolchildren Crossing sign to In-Street School Crossing sign to be more consistent with other signs that it supplements and more accurately describe the use of the sign.

Lastly, FHWA proposes to add an Option to allow an In-Street Pedestrian Crossing or In-Street School Crossing sign at intersections or midblock crossings with flashing beacons.

523. FHWA proposes to retitle Section 7B.04 (existing Section 7B.13) “School Bus Stop Signs” and incorporate information from existing Section 7B.14.

524. FHWA proposed to add a new Section 7B.05 “School Bus Stop When Flashing Signs.” In this section FHWA

proposes a new sign, “STOP FOR SCHOOL BUS WHEN RED LIGHTS FLASH” to remind drivers of the requirement to stop for school buses when the flashing red lights on the school bus are in operation. FHWA proposes this new sign in response to a recommendation from the NCUTCD as many States currently use variations of regulatory word messages for this purpose. The new sign would standardize the message for drivers.

525. FHWA proposes to retitle Section 7B.06 (existing Section 7B.15) “School Speed Limit Signs and Plaques” and incorporate information from existing Section 7B.16.

FHWA proposes to change Standard P3 in existing Section 7B.15 to Guidance to allow flexibility on required signing for fines in school zones based on engineering judgment. Many States have higher fines by statute in school zones, work zones, and other locations; therefore, requiring the use of the FINES HIGHER, FINES DOUBLE, or \$XX FINE plaques could place an undue burden on States and municipalities to sign for every location where there are increased fines.

Also, FHWA proposes to revise existing Guidance P7 to recommend that the maximum beginning point of a reduced school speed limit zone in advance of school grounds is 500 feet. The recommendation was suggested by the NCUTCD and based on the results of research conducted on Speeds in School Zones.¹¹⁴

Lastly, FHWA proposes to add a new Guidance paragraph to clarify that duplicate plaques for fines should be omitted if other traffic violations in addition to exceeding the speed limit are subject to higher fines based on Official Ruling No. 7(09)–3(I).

526. In Section 7D.01 (existing Section 7D.03) “Qualifications of Adult Crossing Guards,” FHWA proposes to incorporate the existing Option from existing Section 7D.02.

527. In Section 7D.02 (existing Section 7D.05) “Operating Procedures for Adult Crossing Guards,” FHWA proposes to incorporate the existing Standard from existing Section 7D.04.

Also, FHWA proposes to add a Standard requiring that the STOP paddle comply with the provisions for a STOP/SLOW paddle and provide a reference to Section 6D.02 for information. FHWA also adds a reference to STOP paddles in Section 6D.02. Note: this proposed new

¹¹³ FHWA’s Official Ruling No. 7(09)–3(I), August 17, 2020, can be viewed at the following internet website: <https://mutcd.fhwa.dot.gov/regdetails.asp?id=1150>.

¹¹⁴ FHWA/TX–09/0–5470–1, “Speeds in School Zones,” can be viewed at the following internet website: <http://tti.tamu.edu/documents/0-5470-1.pdf>.

language is intended to state an existing requirement specifically regarding the provisions of the STOP paddle and is not a new requirement.

Lastly, FHWA proposes to delete existing Options P4 and P5 and Standard P6 regarding the flashing lights because it is redundant information that is contained in Section 6E.03.

Discussion of Proposed Amendments to Part 8 Traffic Control for Railroad and Light Rail Transit Grade Crossings

528. In Section 8A.01 Introduction, FHWA proposes a new Support statement that the highway agency or authority with jurisdiction, the regulatory agency with statutory authority, and the railroad company or transit agency jointly perform the engineering study of grade crossings and the traffic control devices that are associated with them. FHWA proposes this new language to encourage coordination and cooperation between the appropriate knowledgeable parties of interest.

FHWA also proposes new Support statements regarding grade crossing warning systems, which complement the existing support statement about traffic control systems at grade crossings.

529. FHWA proposes a new section numbered and titled, "Section 8A.02 Highway-LRT Grade Crossings," which is comprised of existing P8 through 12 of Section 8A.01. FHWA proposes to revise Item B to highlight that LRT has the right-of-way over other road users at grade crossings and intersections in a semi-exclusive alignment, and to revise Item C to highlight that LRT does not have the right-of-way over other road users at grade crossings and intersections in a mixed-use alignment. FHWA proposes this change to provide clarity regarding right-of-way at semi-exclusive and mixed-use alignments.

FHWA also proposes a revised Guidance statement to recommend that if a highway-LRT grade crossing is equipped with a flashing-light signal system and is located within 200 feet of an intersection or midblock controlled by a traffic control signal, a pedestrian hybrid beacon, or an emergency-vehicle hybrid beacon, the highway traffic signal should be provided with preemption. FHWA proposes this change to encourage use of preemption in such locations.

Finally, FHWA proposes a new Option statement allowing the use of traffic signal priority or preemption if determined to be appropriate by a Diagnostic Team when LRT vehicles are operating in a mixed-use alignment.

FHWA proposes this change because there might be locations where traffic signal priority or preemption is appropriate.

530. In Section 8A.03 (existing Section 8A.02), retitled, "Use of Standard Devices, Systems, and Practices at Grade Crossings," FHWA proposes new Standard paragraphs to require that the Diagnostic Team shall reach a determination through consensus, documented in an engineering study, on new grade crossing traffic control systems and on proposed changes to an existing grade crossing traffic control system. FHWA proposes this change, consistent with 49 CFR part 222, appendix F, because there are a large number of significant variables to be considered and no single standard system of traffic control devices is universally applicable for all grade crossings.

FHWA also proposes a new Option statement that general maintenance activities or minor operational changes to the grade crossing traffic control system that do not have a negative impact on the overall operation of the traffic control system can be made without a Diagnostic Team. FHWA proposes this change to provide agencies with more flexibility and to reduce the burden on Diagnostic Team members for minor changes.

Lastly, FHWA proposes to add a new Guidance paragraph to recommend that the Diagnostic Team distributes the determination made regarding traffic control system at a grade crossing to the Diagnostic Team members. FHWA proposes this change to encourage documentation of the decisions made regarding traffic control systems at grade crossings.

531. In Section 8A.04 (existing Section 8A.03) Use of Standard Devices, Systems, and Practices at Highway-LRT Grade Crossings, FHWA proposes to delete several Support, Standard, Guidance, and Option paragraphs, because most of this text is now proposed to be incorporated into Sections 8A.02 and 8A.03.

532. FHWA proposes a new section numbered and titled, "Section 8A.05 Engineering Studies at Grade Crossings" comprised of P2 through P4 of existing Section 8A.02 and P5 of existing Section 8A.03 as part of the reorganization to group similar information together.

FHWA also proposes a new Guidance statement recommending the factors to be considered in the determining which traffic control devices are appropriate to install at a grade crossing.

533. In Section 8A.06 (existing Section 8A.04) Uniform Provisions, FHWA proposes a new Guidance

paragraph regarding raised median islands installed supplemental to an automatic gate to discourage road users from driving around a lowered gate.

FHWA also proposes to add a Guidance statement discouraging the use of two-way center left turn lanes in the immediate vicinity of grade crossings and recommending other treatments. FHWA proposes this change because two-way left turn lanes at grade crossings are problematic, especially when automatic gates are or may be installed. Only extending gates to the center of the two-way left turn lane on both sides of the crossing insufficiently discourages road users in that lane from circumventing the gates and is in conflict with 49 CFR 234.223. This practice is consistent with the American Railway Engineering and Maintenance-of-Way Association (AREMA) Manual for Railway Engineering (MRE),¹¹⁵ current edition and the AREMA Communication & Signals Manual.¹¹⁶

534. FHWA proposes a new section numbered and titled, "Section 8A.07 Minimum Track Clearance Distance" to provide Support statements regarding the minimum track clearance distance at a grade crossing. FHWA proposes this new section to describe more fully the applications of Minimum Track Clearance Distance that are too lengthy and complex to be included with the definition in Part 1. All uses of the term within other sections of Part 8 include a cross reference to Section 8A.07 so that readers would know where to go to find out how this term is applied.

535. FHWA proposes a new section numbered and titled, "Section 8A.08 Adjacent Grade Crossings" to provide Support and Guidance statements for adjacent grade crossings. FHWA proposes this new section, because it is important to treat closely-spaced grade crossings properly, which sometimes result from separate railroads or a railroad and an LRT alignment operating in parallel corridors. FHWA also includes a reference to Part 3.1.11 of the "AREMA Communications & Signals Manual"¹¹⁷ for more information about adjacent grade crossings that are located within 200 feet of each other.

536. In Section 8A.09 (existing Section 8A.05) Grade Crossing Elimination, FHWA proposes a new

¹¹⁵ The "Manual for Railway Engineering" can be viewed at the following internet website: https://www.arena.org/AREMA_MBRR/AREMAStore/MRE.aspx.

¹¹⁶ The "Communications & Signals Manual" can be viewed at the following internet website: https://www.arena.org/AREMA_MBRR/AREMAStore/Communications_Signals_2019.aspx.

¹¹⁷ *Ibid.*

Option statement permitting an engineering study to determine the costs and benefits of eliminating a crossing that appears to be redundant or unnecessary. In concert with this change, FHWA proposes to add Guidance paragraphs recommending the engineering study and subsequent steps for eliminating the grade crossing if it is determined to be appropriate. This replaces the existing Guidance statement about eliminating grade crossings that cannot be justified. FHWA proposes this new material to provide practitioners with information to assist with eliminating grade crossings, which are a potential source of crashes and congestion. FHWA also proposes to delete a Guidance paragraph that seemed to recommend that engineering studies regarding potential grade crossing elimination should be conducted for every grade crossing.

537. In Section 8A.12 (existing Section 8C.12) Grade Crossings Within or In Close Proximity to Circular Intersections, FHWA proposes to change the Standard regarding an engineering study to determine queuing impacts to a Guidance statement to provide agencies with more flexibility in the engineering study and design of grade crossings near circular intersection.

538. FHWA proposes a new section numbered and titled, "Section 8A.13 Busway Grade Crossings" to provide Standards, Guidance, Support, and Option statements for busway grade warning and crossing systems. FHWA proposes this new section to provide standardization of traffic control devices for grade crossings of highways with busways.

539. In Section 8A.14 (existing Section 8A.08) Temporary Traffic Control Zones, FHWA proposes a new Guidance paragraph regarding temporary traffic control zones that extend over grade crossings equipped with automatic gates and either one-lane two-way or reversible lane operation is used.

FHWA also proposes to add a new Guidance paragraph recommending the preparation of a traffic control plan when traffic is detoured over an existing grade crossing with passive warning devices. FHWA proposes this change because it is important to analyze traffic safety during detours.

540. In Section 8B.02 Sizes of Grade Crossing Signs, FHWA proposes to clarify that the sizes shown in Table 8B-1 are minimum sizes. FHWA also proposes to change the minimum required size of a Yield sign at multi-lane conventional road grade crossings from 48"× 48" to 36"× 36." FHWA proposes this change to provide clarity

regarding the requirements of the sign size and based on Official Ruling No. 8(09)–7(I).¹¹⁸

541. In Section 8B.03 Grade Crossing (Crossbuck) Sign (R15–1) and Number of Tracks Plaque (R15–2P) at Active and Passive Grade Crossings, FHWA proposes to upgrade an existing Option to a Standard to require a minimum of one Crossbuck sign on each highway approach to a gated highway-LRT grade crossing on a semi-exclusive alignment. FHWA proposes this change to make sure that road users understand why a gate is present.

FHWA proposes to revise existing Paragraph 5 to require the Number of Tracks plaque below the Crossbuck sign where there are two or more tracks at a grade crossing, regardless of the presence of automatic gates. This revision is necessary because the presence of two or more tracks at a crossing adds complexity for road users and additional risks, such as in situations in which trains occupy both tracks, where the tracks are spaced such that a vehicle could become stuck between the tracks, or where the visibility of the second track is limited. This revision would improve safety by providing uniformity for multitrack crossings that would accommodate the expectancy of the road user.

FHWA also proposes to revise existing Paragraph 7 to reduce the requirement for retroreflective white material on the back of the Crossbuck sign to apply only to passive grade crossings. FHWA proposes this change because active grade crossings have signals or warning lights for traffic control device conspicuity.

FHWA also proposes new Standard paragraphs regarding minimum lateral clearance between the edge of the Crossbuck sign and the face of a vertical curb, edge of traveled way, and/or edge of paved or surfaced shoulder. FHWA proposes this change to be consistent with the dimensions shown in Figure 8B-3 for Crossbuck Assemblies and to be consistent with Paragraphs 6, 7, and 8 of existing Section 8C.01.

FHWA also proposes a new Guidance statement recommending the Crossbuck sign to be at least 12 feet from the center of the nearest track. FHWA proposes this change to formalize the dimensions shown on Figure 8D-2.

FHWA also proposes a new Guidance paragraph recommending the mounting height to the center of Crossbuck signs to be approximately 9 feet and an

Option to adjust the height based on local conditions and to accommodate signs below the Crossbuck sign. FHWA proposes this change to clarify the dimension shown on Figure 8B-2.

542. In Section 8B.04 Crossbuck Assemblies with YIELD or STOP Signs at Passive Grade Crossings, FHWA proposes a new Guidance paragraph recommending the use of a STOP sign at the Crossbuck Assembly where a passive grade crossing is located at the stem of a T-intersection with inadequate clear storage area between the tracks and the parallel roadway. FHWA also proposes that if a STOP sign is installed, consideration should also be given to installing a YIELD sign at the highway-highway intersection. FHWA proposes this new text to provide practitioners with additional information for crossings with this geometry.

FHWA also proposes a new Standard paragraph requiring a Yield sign and TO TRAINS (R15–9P) supplemental plaque when Crossbuck Assemblies are used within the limits of a highway-highway intersection controlled by a traffic control signal not interconnected with the grade crossing and not preempted by the approach of rail traffic. FHWA also proposes to prohibit the use of a Stop sign with the Crossbuck Assembly in this situation. FHWA proposes this change for consistency with Section 4A.08 (existing Section 4D.34) regarding the use of stop signs with traffic control signals.

FHWA proposes to revise existing Paragraph 10 regarding YIELD and STOP sign mounting heights on Crossbuck Assemblies to require at least 5 feet in rural areas and at least 7 feet in areas where parking or pedestrian movements are likely to occur. FHWA proposes this change to provide consistency throughout the Manual regarding vertical mounting height.

FHWA also proposes to revise the existing Guidance paragraph regarding a Crossbuck Assembly on a separate support than the Crossbuck sign, to clarify the recommended location of YIELD or STOP sign in relationship to the Crossbuck sign and to clarify the lateral clearances from a curb or edge of traveled way. FHWA proposes this change to provide consistency throughout the Manual regarding lateral offset.

FHWA also proposes to revise the existing Standards regarding the vertical strip of retroreflective white material on a Crossbuck support to clarify that a white retroreflective strip wrapped around a round support satisfies the requirement as long as the round support has an outside diameter of at least 2 inches. FHWA proposes this

¹¹⁸ FHWA Official Ruling No. 8(09)–7 (I), April 8, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/8_09_7.htm.

change to provide clarity regarding the requirements of the white retroreflective strip and based on Official Ruling No. 8(09)–1(I).¹¹⁹

543. In Section 8B.05 Use of STOP (R1–1) or YIELD (R1–2) Signs without Crossbuck Signs at Highway-LRT Grade Crossings, FHWA proposes to eliminate the Guidance statement regarding LRT speed and replace it with a Guidance statement in Section 8D.04 (Use of Active Traffic control Systems at LRT Grade Crossings) with recommendations for active traffic control systems where LRT operating speeds are less than 25 mph unless an engineering study determines that passive devices would provide adequate control. FHWA proposes this change based on the stopping distance of LRT vehicles at speeds less than 25 mph and consistent with industry practice.

544. In Section 8B.06 Grade Crossing Advance Warning Signs (W10–1 through W10–4), FHWA proposes to modify the Standard statement to remove the requirement at all highway-LRT grade crossing in semi-exclusive alignments and add a condition that the warning signs are not required where Crossbuck signs are not used. FHWA proposes these changes to reduce the number of locations where Grade Crossing Advance Warning Signs are required at highway-LRT grade crossings.

545. In Section 8B.07 (existing Section 8B.09) DO NOT STOP ON TRACKS Sign (R8–8), FHWA proposes a new Guidance paragraph recommending the use of a DO NOT STOP ON TRACKS (R8–8) sign if a traffic control signal is installed within 200 feet downstream from a grade crossing such that highway vehicle queues are likely to extend onto the tracks except where a pre-signal is installed. FHWA proposes this change to improve safety at grade crossings near signalized intersections.

FHWA also proposes to revise existing Paragraph 1 to separate the provision into two paragraphs and to delete the text regarding an engineering study. FHWA proposes this change to provide agencies more latitude in installing the R8–8 sign based on engineering judgment.

546. In Section 8B.08 (existing Section 8B.10) TRACKS OUT OF SERVICE Sign (R8–9), FHWA proposes a new Option statement allowing warning signs such as Low Ground Clearance Crossing (W10–5) and

Skewed Crossing (W10–12) to be left in place after tracks are taken out of service to warn road users about physical roadway conditions that are still present. FHWA proposes this change to provide agencies with flexibility to retain signs for a longer period than other traffic control devices at the crossing.

FHWA also proposes two new Standards requiring that Emergency Notification System (I–13) signs be retained at grade crossings that are out of service until the tracks are removed or covered. Emergency Notification System signs provide emergency contact information for the railroad responsible for the crossing. Retaining the existing signs until the tracks are removed would ensure a contact number is available for road users to reach if there is a safety concern or another issue that requires the railroad to be contacted.

547. FHWA proposes new Option and Support statements in Section 8B.16 (existing Section 8B.23) to address warning, selective exclusion, and detour signing for additional vehicle types and combinations that may encounter hang-up situations at low ground clearance crossings. The proposed changes are in response to NTSB recommendation H–18–24.¹²⁰

548. FHWA proposes to relocate existing Section 8.17 LOOK Sign (R15–8) to Section 9B.21 to allow the use of a LOOK sign on a shared-use path or separated bikeway at a grade crossing. FHWA proposes this change because these signs are no longer to be installed to communicate with drivers, as the YIELD or STOP sign on the Crossbuck Assemblies at passive crossings imply that motorists should look for rail traffic. An Option was also added in Section 8E.03 for using LOOK signs for pathways and sidewalks.

549. In Section 8B.20 (existing Section 8B.24) Storage Space Signs (W10–11, W10–11a, W10–11b), FHWA proposes a new Standard paragraph that clarifies that the Storage Space sign shall not be used as a replacement for the Advanced Warning (W10–1) sign and that the signs shall be mounted on separate posts. FHWA proposes this change because it is important that the Advance Warning sign have priority over the Storage Space sign.

550. FHWA proposes a new section numbered and titled, “Section 8B.23 Next Crossing Plaques (W10–14P and

W10–14aP)” to provide Option statements describing where the NEXT CROSSING (W10–12P) plaque and USE NEXT CROSSING (W10–14aP) plaque may be mounted.

551. FHWA proposes a new section numbered and titled, “Section 8B.24 ROUGH CROSSING Plaque (W10–15P)” to provide an Option statement for the installation of the ROUGH CROSSING (W10–15P) plaque.

552. In Section 8B.26 (existing Section 8B.18) Emergency Notification System Sign (I–13), FHWA proposes changing P1 from Guidance to Standard to require installing Emergency Notification signs for all highway-rail grade crossings and all highway-LRT grade crossings on semi-exclusive alignments. FHWA proposes this change to be consistent with regulations promulgated by the FRA.¹²¹

FHWA also proposes a new Standard paragraph requiring minimum width and height dimensions, as well as number and letter heights for the Emergency Notification sign to be consistent with new requirements promulgated by the Federal Railroad Administration (FRA). FHWA also proposes changing the provision for the sign to be retroreflective from Guidance to a Standard to be consistent with requirements promulgated by the FRA.¹²²

FHWA proposes an Option statement allowing the seven-character grade crossing inventory number to be shown on the sign as a black legend on a white rectangular background. FHWA proposes this change to allow additional flexibility.

FHWA also proposes a new Guidance statement recommending Emergency Notification signs be attached to the Crossbuck Assemblies or grade crossing signal masts on the right-hand side of each roadway approach to the grade crossing. FHWA proposes this recommendation to provide uniformity in sign placement.

Finally, FHWA proposes an Option statement to allow Emergency Notification signs to be located on a separate post and permitting additional Emergency Notification signs to be installed at a grade crossing.

553. FHWA proposes relocating the pavement markings sections from Chapter 8B and placing them in a new Chapter 8C to make it easier for the reader to find text in the MUTCD. FHWA proposes a new section numbered and titled, “Section 8C.01 Purpose and Application” to provide Support statements to describe the

¹¹⁹ FHWA Official Ruling No. 8(09)–1(I), March 10, 2010, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/8_09_001.htm.

¹²⁰ “Collision Between Freight Train and Charter Motorcoach at High-Profile Highway-Railroad Grade Crossing, Biloxi, Mississippi, March 7, 2017,” NTSB/HAR1801, can be viewed at the following internet website: https://www.nts.gov/investigations/_layouts/ntsb.recsearch/Recommendation.aspx?Rec=H-18-024.

¹²¹ 49 CFR 234.311.

¹²² 49 CFR 234.309.

purpose and application of markings at grade crossings to provide context for the remainder of new Chapter 8C.

554. In Section 8C.02 (existing Section 8B.27) Pavement Markings, FHWA proposes a Standard statement incorporating an existing requirement that pavement markings be placed in each approach lane on all paved approaches to highway-LRT grade crossings where a Crossbuck sign is placed at the grade crossing. FHWA proposes this change in conjunction with making the first three paragraphs of this section applicable only to highway-rail grade crossings. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement.

FHWA also proposes a new Standard statement that if pavement markings are used on a multi-lane approach to a grade crossing, identical markings shall be placed in each approach lane that crosses the tracks. FHWA proposes this change because pavement markings serve an important function to warn road users of the presence of a grade crossing and drivers will always be able to see the full message even when traffic is stopped in adjacent lanes by having the entire symbol placed in their own lane.

FHWA also proposes to delete a portion of P5 recommending that the X symbol and letters at grade crossings to be elongated. FHWA proposes this change because the standard layout for the symbol is already elongated.

Finally, FHWA proposes a new Guidance statement recommending that if supplemental pavement marking symbols are placed between the Grade Crossing Advance Warning sign and the grade crossing, then the downstream transverse line should be at least 50 feet in advance of the stop or yield line at the grade crossing. FHWA proposes this change to provide uniform placement of the supplemental pavement marking symbols and to avoid the appearance that the downstream transverse line is the stop line or that the downstream transverse line and the stop line form a crosswalk.

555. In Section 8C.03 (existing section 8B.28) Stop and Yield Lines, FHWA proposes to modify the last Guidance and Standard statements in this section to clarify the location of stop lines where active traffic control devices are used.

556. FHWA proposes a new section numbered and titled, "Section 8C.04 Lane-Use Arrow Markings" to provide a Standard and Guidance on the placement of lane-use arrow markings. FHWA proposes this change to address recent train-auto crashes in which a

roadway user made an improper turn and turned onto the railroad tracks rather than at an adjacent intersection immediately beyond the grade crossing. In these crashes, an arrow pavement marking denoting an exclusive lane was located on the roadway between the stop line for the grade crossing and the track area.³⁰ FHWA proposes a new section numbered and titled, "Section 8C.05 Edge Lines, Lane Lines, Raised Pavement Markers, and Tubular Markers" to provide Guidance, Option, and Standard statements regarding the use of edge lines, lane lines, raised pavement markers, and tubular markers on an approach to a grade crossing. FHWA proposes this addition to address recent train-auto crashes in which a roadway user made an improper turn and turned onto the railroad tracks rather than at an adjacent intersection immediately beyond the grade crossing. In these crashes, the roadway edge line stopped near the stop line for the grade crossing and did not continue across the track area.

557. In Section 8C.06 (existing Section 8B.29) Dynamic Envelope Markings, FHWA proposes to delete the Support statement describing dynamic envelope markings because the definition is covered in Part 1.

FHWA also proposes to revise the existing Standard statement to allow dynamic envelope markings to be up to 24 inches wide. This change is proposed to provide agencies with more flexibility to improve visibility and to provide easier maintenance of the markings.

FHWA also proposes to add a new Option paragraph allowing white cross-hatching lines to be placed on the highway pavement within the dynamic envelope as a supplement to the 4-inch normal solid white lines and in areas adjacent to the dynamic envelope where vehicles are not intended to stop or stand. FHWA proposes this addition, as well as a figure with examples, to provide agencies with additional options to emphasize the dynamic envelope and discourage vehicles from stopping in the approach to the dynamic envelope.

558. In Section 8D.01 (existing Section 8C.01) Introduction, FHWA proposes to add a Guidance statement recommending that when the automatic gate is in its upright position, no portion of the physical features of flashing-light signals and gates should be closer than 12 feet from the center of the nearest track. FHWA proposes this language to provide adequate vertical clearance in the vicinity of the tracks and to formalize the dimensions shown in Figure 8D-2 (existing Figure 8C-2).

FHWA also proposes to eliminate the Support statement in existing Paragraph 15 regarding LRT typical speeds through semi-exclusive and mixed-use alignment because the statement does not add useful information. In concert with this change, FHWA proposes to relocate existing Paragraph 16 to the beginning of the Section with the other Support statements.

559. In Section 8D.02 (existing Section 8C.02) Flashing-Light Signals, FHWA proposes to add a Guidance statement, and an accompanying Support statement regarding the placement of the Number of Tracks plaque with respect to the flashing-light backgrounds, as well as the Crossbuck sign.

FHWA also proposes adding a Guidance paragraph recommending that if flashing-light signals are used, at least one pair of flashing lights should be provided for each approach lane of the roadway. FHWA proposes this Guidance to provide uniform flashing light signals across the roadway.

FHWA proposes three Guidance paragraphs to provide text that supports the dimensions for placement and mounting shown in Figure 8D-1 (existing Figure 8C-1).

FHWA also proposes Guidance paragraphs recommending that where the storage distance for vehicles approaching a grade crossing is less than a design vehicle length, the Diagnostic Team should consider providing additional flashing-light signals aligned toward the movement turning toward the grade crossing. FHWA also recommends that the Diagnostic Team consider the use of additional flashing-light signals to provide supplemental warning to pedestrians. FHWA proposes these changes to provide additional warning of the grade crossing.

Finally, FHWA proposes to delete the last Standard statement in this section, because the provisions are covered elsewhere.

560. In Section 8D.03 (existing Section 8C.04) Automatic Gates, FHWA proposes a Standard requiring the width of the retroreflective sheeting on the front of the gate arm to be at least 4 inches. FHWA proposes this addition to provide an adequate width of material for visibility.

FHWA also proposes a Standard statement requiring that except for the continuously illuminated light at the tip of the gate, the left-most flashing gate light in each additional pair of lights flashes simultaneously with the left-hand light of the flashing-light signals and the right-most flashing gate light in each additional pair of lights flashes

simultaneously with the right-hand light of the flashing-light signals. FHWA proposes this addition to provide uniformity in flashing patterns between the flashing-light signals and the flashing lights on the gate.

FHWA proposes a Guidance paragraph with recommendations for the location of the tip of the automatic gate arm when it is in the down position relative to the center of the nearest track. FHWA proposes this addition to support the dimensions shown in Figure 8D-2 (existing Figure 8C-2).

Finally, FHWA proposes Guidance paragraphs with recommendations for the length, height, and position of the automatic gate arm. FHWA proposes these additions to support the dimensions shown in Figure 8D-1 (existing Figure 8C-1).

561. FHWA proposes a new section numbered and titled, "Section 8D.04 Use of Active Traffic Control Systems at LRT Grade Crossings" that replaces existing Sections 8C.03 and 8C.05.

FHWA also proposes active traffic control system Standards for highway-LRT grade crossings based on the maximum operating speed of the LRT vehicles. Where the maximum LRT operating speed exceeds 40 mph, active traffic control systems with automatic gates would be required. Where the maximum LRT operating speed is greater than 25 mph but is less than 40 mph, active traffic control systems would be required and automatic gates would be optional. FHWA proposes this change based on the safety experience of modern LRT systems and to replace paragraphs that were previously in existing Section 8C.03.

FHWA also proposes a Guidance statement with recommendations for active traffic control systems where LRT operating speeds are less than 25 mph unless an engineering study determines that passive devices would provide adequate control.

FHWA also proposes a Guidance statement with a recommendation not to use a traffic control signal alone at locations that are not intersections and LRT speeds are above 20 mph.

562. In Section 8D.05 (existing Section 8C.06), retitled, "Exit Gate and Four-Quadrant Gate Systems," FHWA proposes to add Support paragraphs to clarify the difference between Exit Gate systems and Four-Quadrant Systems.

FHWA also proposes a Standard statement to require the queue clearance time be long enough to permit the exit gate arm to lower after a design vehicle of maximum length is clear of the minimum track clearance distance where a Four-Quadrant Gate system is present. This proposed Standard is

necessary to ensure that vehicles can clear the tracks safely without becoming entrapped between the gates on the tracks while a train is approaching.

In addition, FHWA proposes to add a Guidance statement recommending that exit gates be independently controlled for each direction of roadway traffic. FHWA proposes these additions to provide consistency with industry practice.

Lastly, FHWA proposes to delete existing Paragraph 17 because this recommendation resulted in exit gates being located significantly further from the grade crossing than the entrance gates.

563. FHWA proposes a new section numbered and titled, "Section 8D.07 Another Train Coming" to provide Guidance and Support for a new traffic control device to provide warning of another train approaching a grade crossing. FHWA proposes this addition to provide practitioners with information for uniform application.

564. In Section 8D.09 (containing portions of existing Section 8C.09), retitled, "Use of Traffic Control Signals at Grade Crossings," FHWA proposes an edit to the Option that allows traffic control signals be used instead of flashing-light signals to control road users at industrial highway-rail grade crossings and other places where the maximum speed of trains is 10 mph or less. FHWA proposes this change to include a specific train speed to improve clarity and to be consistent with FRA track classifications.

565. FHWA proposes a new section numbered and titled, "Section 8D.10 Preemption of Highway Traffic Signals at or Near Grade Crossings." Several of the paragraphs in the proposed new section are from existing Section 8C.09.

FHWA also proposes new Standards, Guidance, Options, and Support statements regarding traffic signal preemption at grade crossings. FHWA proposes this new material to provide consistency with the changes in the industry resulting from the investigation into the causes of the fatal train/school bus crash in Fox River Grove, Illinois.¹²³

FHWA proposes new Support statements about the systems that are involved in preemption. FHWA proposes the change to provide agencies with additional background information about preemption.

¹²³ "Highway/Railroad Accident Report Collision of Northeast Illinois Regional Commuter Railroad Corporation (METRA) Train and Transportation Joint Agreement School District 47/155 School Bus at Railroad/Highway Grade Crossing in Fox River Grove, Illinois on October 25, 1995" NTSB/HAR-96/02, can be viewed at the following internet website: <https://www.nts.gov/investigations/AccidentReports/Reports/HAR9602.pdf>.

FHWA also proposes changes to Guidance to include additional measures for situations where the traffic signal is located farther than 200 feet from the grade crossing. FHWA proposes the change to provide additional information to agencies to improve safety at grade crossing that do not have preemption.

FHWA also proposes new Guidance paragraphs to provide additional recommendations for the use of active grade crossing warning systems near traffic signals, the use of automatic gates at traffic signals with preemption, and the annual inspection of the preemption operation. FHWA proposes the changes to reflect industry practices resulting from investigation of train/vehicle crashes.

FHWA proposes a new Standard paragraph that requires preemption where traffic signal faces are located within 50 feet of a grade crossing that has flashing-light signals. FHWA proposes this change to avoid display of traffic signal indications that conflict with the flashing-light signal system.

FHWA also proposes new Support and Option statements to provide additional information about double-break and supervised circuits. FHWA proposes this change to provide practitioners with information to make the preemption fail-safe.

FHWA also proposes new Guidance statements to provide recommendations for locations with track detection circuits at passive grade crossings and left turn movements at a preempted traffic signal downstream from a grade crossing. FHWA proposes the changes to provide agencies with recommendations for situations that are not addressed in the existing MUTCD.

FHWA also proposes new Guidance and Support statements to describe the considerations and recommendations for application of simultaneous and advance preemption. FHWA proposes these changes to provide practitioners with more information to improve consistency in the application of preemption.

FHWA also proposes new Standard statements regarding the end of the track clearance interval. FHWA proposes these changes to prohibit the track clearance interval from being terminated too early in situations when there is variability in train approach times.

FHWA also proposes a new Guidance statement recommending the use of advanced preemption with exit gates. FHWA proposes this change because additional preemption time is needed for the safe operation of the exit gate system.

FHWA also proposes new Guidance statements recommending the ability of traffic signal equipment to restart or reservice preemption requests. FHWA proposes this change to provide consistent preemption operation where train movements may stop or start on the approach to the grade crossing.

FHWA also proposes a new Standard statement to prohibit the flashing mode of a traffic signal from beginning until rail traffic has entered the grade crossing. FHWA proposes this change to prevent road user confusion that could result in stopping on the tracks.

Finally, FHWA proposes a new Standard paragraph to require evaluation of the priority of preemption calls when both boats and trains operate at a grade crossing. FHWA proposes this change to require agencies to resolve competing preemption requests.

566. In Section 8D.11 (existing Section 8B.08), retitled, "Movements Prohibited During Preemption," FHWA proposes new Guidance and Option statements that prohibit movements towards a grade crossing using traffic signal indications and blank-out signs. FHWA proposes this change to provide more detailed recommendations and information to agencies for the prohibition of permissive-only turn movements, protected-only turn movements and straight-through movements towards a grade crossing.

FHWA also proposes new Guidance statements for the recommended use of LRT-activated blank-out signs. FHWA proposes this change to improve consistency in the application of the signs.

Finally, FHWA proposes a revised Standard that requires blank-out signs used in preemption be activated only when the preemption is active. FHWA proposes this change to improve the consistent operation of the signs.

567. FHWA proposes a new section numbered and titled, "Section 8D.12 Pre-Signals at or Near Grade Crossings." Several of the paragraphs in this proposed new section are from existing Section 8C.09.

FHWA proposes revised and new Standards that require red signal indications to be displayed during preemption. FHWA proposes the change to prevent conflicting indications between the pre-signal and the grade crossing flashing-light signal system.

FHWA also proposes a new Guidance paragraph to recommend measures at downstream traffic signals. FHWA proposes this change to reduce vehicles queuing from a downstream signal through a grade crossing.

FHWA also proposes revised and new Options for the green interval. FHWA

proposes this change to provide agencies with additional information and flexibility in the operation of a pre-signal.

FHWA also proposes a new Standard statement to define the calculation of the queue clearance time. FHWA proposes the change to improve safety of road users by ensuring the queue clearance time is long enough to clear vehicles out of the grade crossing after the pre-signal indications turn red.

FHWA also proposes new Guidance paragraphs to provide recommendations for indications over turn lanes that extend from a downstream intersection through a pre-signal. FHWA proposes the change to avoid road user confusion between indications at a pre-signal and a downstream traffic signal and based on Official Ruling No. 8(09)–19(I).¹²⁴

FHWA also proposes new Standards and Support paragraphs that require agencies to use specific indications at a pre-signal. FHWA proposes the change to improve safety by discouraging road users from inadvertently turning onto railroad or LRT tracks.

Finally, FHWA proposes new Option statements for the location of pre-signal indications and additional signing. FHWA proposes the changes to provide agencies with flexibility to install indications where they will be most visible and effective.

568. FHWA proposes a new section numbered and titled, "Section 8D.13 Queue Cutter Signals at or Near Grade Crossings" for the placement and implementation of queue cutter signals near grade crossings.

FHWA proposes new Support and Option statements to provide information about the application, and operation of queue cutter signals. FHWA proposes the change to allow agencies explicitly to install queue cutter signals which are not addressed in the existing MUTCD.

FHWA also proposes a new Standard paragraph that requires agencies to use specific indications at a queue cutter signal. FHWA proposes the change to improve safety by discouraging road users from inadvertently turning onto railroad or LRT tracks.

FHWA also proposes new Options for the locations of queue cutter indications. FHWA proposes the changes to provide agencies with flexibility to install indications where they will be most visible and effective.

FHWA also proposes new Guidance and Options for signing associated with

the queue cutter. FHWA proposes the changes to provide agencies with flexibility to install signing that discourages road users from stopping in the grade crossing.

FHWA also proposes new Guidance and Options for the operation of queue cutter signals. FHWA proposes the change to provide recommendations for the safe and effective operation of the signal.

FHWA also proposes new Standards that require interconnection and preemption of a queue cutter signal. FHWA proposes the change to require uniform application and to prevent conflicting or confusing displays by the queue cutter signal and flashing-light signal system.

FHWA also proposes new Guidance and Support paragraphs to provide recommendations and information for indications over turn lanes that extend from a downstream intersection through a queue cutter. FHWA proposes the change to avoid road user confusion between indications at a pre-signal and a downstream traffic signal.

FHWA also proposes new Standards and Support statements to require additional measures for situations where a turn lane from a downstream intersection is controlled separately from through movements at a queue cutter signal. FHWA proposes the change to avoid road user confusion when different indications are displayed in adjacent lanes at a queue cutter signal and based on Official Ruling No. 8(09)–19(I).¹²⁵

Finally, FHWA proposes new Support statements that provides information differentiating a queue cutter signal and a queue jump signal. FHWA proposes the change to prevent confusion by users of the MUTCD.

569. FHWA proposes a new section numbered and titled, "Section 8D.14 Warning Beacons or LED-Enhanced Warning Signs at Grade Crossings" for the utilization, activation, and operation of warning beacons and LED-enhanced warning signs at grade crossings.

FHWA proposes new Option and Support paragraphs to provide information about the considerations and application of warning beacons and enhanced signs. FHWA proposes the change to provide consistency in the use of these devices.

FHWA also proposes new Standard and Support statements to require preemption interconnection to control the activation of warning beacons and

¹²⁴ FHWA Official Ruling No. 8(09)–19(I), November 5, 2014, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/8_09_19.htm.

¹²⁵ FHWA Official Ruling No. 8(09)–19(I), November 5, 2014, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/8_09_19.htm.

enhanced signs at grade crossings. FHWA proposes the change to improve safety through the consistent and fail-safe operation of the devices.

FHWA also proposes new Option and Guidance statements to recommend the timing of warning beacon and sign activation. FHWA proposes the change to provide for consistent operation of the devices.

Finally, FHWA proposes a new Guidance paragraph that recommends the use of back-up power for warning beacons and enhanced signs. FHWA proposes the change to reflect best practices for devices at grade crossings.

570. In Section 8D.15 (existing Section 8C.10) Traffic Control Signals at or Near Highway-LRT Grade Crossings, FHWA proposes to delete existing P16 that recommends that all existing turning movements toward the highway-LRT grade crossing be prohibited when a signalized intersection is preempted and located within 200 feet of a highway-LRT grade crossing. FHWA proposes the change because the Guidance is redundant with new Section 8D.10.

571. In Section 8D.16 (existing Section 8C.11), retitled, "Use of LRT Signals for Control of LRT Vehicles at Highway-LRT Grade Crossings," FHWA proposes to delete Paragraph 1 recommending special LRT signal indications for LRT movements in semi-exclusive alignments at non-gated grade crossings that are equipped with traffic control signals. FHWA proposes this change to be consistent with the updated definition of a semi-exclusive LRT alignment.

FHWA also proposes to delete the LRT traffic signal configurations in Figure 8D-3 (existing Figure 8C-3). FHWA proposes this change to provide agencies with more flexibility in the design of LRT signal configurations.

FHWA proposes to add Guidance, Standard, and Option statements regarding the positioning of signal faces used to control LRT movements, requiring special LRT signal indications to be white, and providing the option to allow individual LRT signal sections to be displayed to form clustered signal faces, or for multiple LRT signal indications to be displayed using a single housing. FHWA proposes these changes to improve consistency in the use of LRT signal indications.

572. In Section 8E.01 (existing Section 8D.01) Purpose, FHWA proposes to include sidewalks in the provisions in Chapter 8E (existing Chapter 8D). FHWA also proposes a new Figure 8E-1 and accompanying text to illustrate and describe the difference between a pathway grade crossing and a sidewalk

grade crossing. FHWA proposes these changes, as well as the following proposed changes in Chapter 8E, because additional focus has been placed on accessibility for all modes of travel at grade crossings, and as ridership has increased on light rail, commuter rail, and passenger rail facilities, pedestrian interaction with trains has led to an increasing trend in pedestrian and rail incidents.

573. In Section 8E.02 (existing Section 8D.02) Use of Standard Devices, Systems, and Practices, FHWA proposes a new Guidance statement recommending that the pathway or sidewalk user's ability to detect the presence of approaching rail traffic should be considered in determining the type and placement of traffic control devices at grade crossings, and that a Diagnostic Team should design and develop the traffic control devices.

FHWA also proposes a Support statement and accompanying new figures describing the pathway and sidewalk design that best enhances pedestrian safety at grade crossings.

574. In Section 8E.03 (existing Section 8D.03), retitled, "Pathway and Sidewalk Grade Crossing Signs and Markings," FHWA proposes a new Guidance statement to recommend a 10-foot vertical clearance between overhead traffic control devices and the pathway surface directly under the sign or device on pathways used by equestrians.

FHWA also proposes Standard statements requiring that if overhead traffic control devices are placed above sidewalks, the clearance from the bottom edge of the device to the sidewalk surface directly under the sign or device to be at least 7 feet, and traffic control devices mounted adjacent to sidewalks that are mounted at a height of less than 7 feet must be at least 2 feet laterally offset from the sidewalk. FHWA proposes this change to incorporate existing provisions of Parts 2 and 4, which require a minimum mounting height of 7 feet when a traffic control device extends above the sidewalk. Restatement of these provisions within Part 8 is necessary to minimize situations where pedestrians may hit their heads and become injured while walking under a sign, signal, or other device.

FHWA also proposes Guidance and Option statements for utilizing and mounting the LOOK (R15-8) sign and the Skewed Crossing (W10-12) sign.

FHWA also proposes accompanying revised and new figures to illustrate the application of signing and pavement markings for pathways and sidewalk grade crossings.

FHWA proposes all of the changes in this section to be consistent with other areas of the MUTCD.

575. In Section 8E.04 (existing Section 8D.04) Stop Lines, Edge Lines, and Detectable Warnings, FHWA proposes a new Guidance statement and accompanying new figure recommending that pavement markings be installed in advance of the pathway grade crossing if pathway users include those who travel faster than pedestrians and that a stop line be provided at a pathway grade crossing if the surface where the marking is to be applied is capable of retaining the application of the marking. FHWA also proposes an Option that allows a stop line to be provided at a sidewalk grade crossing if the surface where the marking is to be applied is capable of retaining the marking.

FHWA also proposes Standard and Guidance statements, consistent with existing provisions in Part 3, regarding the design, implementation, and utilization of detectable warnings based on ADAAG criteria and to provide clarity for the new figures that address this issue. These provisions are restatements of the existing requirements of Part 3, which were previously referenced only in a Support statement. FHWA proposes these changes as conforming edits, which would not change the existing underlying provisions.

576. In Section 8E.05 (existing Section 8D.05), retitled, "Passive Traffic Control Devices—Crossbuck Assemblies," FHWA proposes changes to the Standard paragraph, requiring a Crossbuck Assembly to be installed on each approach to the pathway or sidewalk grade crossing when the nearest edge of a pathway or sidewalk grade crossing is located more than 25 feet from the center of the nearest traffic control warning device at a grade crossing.

FHWA also proposes a new Option statement allowing the retroreflective strip on the back of the support to be omitted on the Crossbuck support at a pathway or sidewalk grade crossing.

Finally, FHWA proposes a new Standard statement and accompanying new figure requiring the minimum height of Crossbuck Assemblies installed on pathways or sidewalks to be 4 feet where the lateral offset to the nearest edge of the sign is at least 2 feet and 7 feet where the lateral offset to the nearest edge of the sign is less than 2 feet. The proposed Standard also requires the minimum lateral offset to be 0 feet for sidewalks and 2 feet for pathways.

577. FHWA proposes a new section numbered and titled, “Section 8E.06 Passive Traffic Control Devices—Swing Gates, Fencing, and Pedestrian Barriers” for designing and implementing swing gates, fencing, and pedestrian barriers.

FHWA proposes new Support and Option statements for the application of automatic gates and swing gates for sidewalk or pathway grade crossings. FHWA proposes the change to provide agencies with more information for the consistent and safe application of these measures.

FHWA also proposes a new Guidance statement for the signing recommended on swing gates. FHWA proposes the change to provide pedestrians with clear messages about the use of the swing gate.

Finally, FHWA also proposes a new Support paragraph and accompanying revised figure for the application of fencing near sidewalk or pathway grade crossings. FHWA proposes the change to provide agencies with information about measures that improve the effectiveness of automatic and swing gates at sidewalk and pathway grade crossings.

578. In Section 8E.07 (existing Section 8D.06), retitled, “Active Traffic Control Systems,” FHWA proposes new Standard paragraphs and accompanying revised figure requiring an active traffic control system at pathway-LRT and sidewalk-LRT grade crossings where LRT operating speeds on a semi-exclusive alignment exceed 25 mph. FHWA also proposes to add a new Standard requiring an active traffic control system, including automatic gates at pathway-LRT and sidewalk-LRT grade crossings where LRT operating speeds on a semi-exclusive alignment exceed 40 mph. Both proposed new Standards include an exception to omit flashing-light signals, bells, and other audible warning devices when the pathway or sidewalk grade crossing is located within 25 feet of an active warning device that is equipped with those devices.

FHWA also proposes a new Option statement that allows additional pairs of flashing-light signals, bells, or other audible warning devices to be installed on the active traffic control devices at a grade crossing for pathway or sidewalk users approaching the grade crossing from the back side of those devices.

Lastly, FHWA proposes a new Guidance statement recommending that if there is space, a pedestrian refuge area or island should be provided between the tracks and the roadway where railroad or LRT tracks in a semi-exclusive alignment are immediately adjacent to a roadway.

579. FHWA proposes a new section numbered and titled, “Section 8E.08 Active Traffic Control Devices—Signals,” for pedestrian signal heads, flashing red lights, and other active traffic control devices at pathway and sidewalk grade crossings. Some of the material in this section was relocated from existing Section 8C.13 and has been reorganized to provide all relevant information for flashing-light signals at pathway and sidewalk grade crossings in one section.

FHWA proposes new Standard and Support paragraphs that prohibit the use of pedestrian signal heads at pathway and sidewalk grade crossings. FHWA proposes the change to improve pedestrian safety and prevent user confusion at grade crossings.

FHWA also proposes a new Option statement that allows the use of pedestrian signal heads at pathway and sidewalk grade crossings with LRT. FHWA proposes the change to provide agencies with flexibility where the LRT movements are controlled by a traffic signal.

FHWA also proposes new Standards for flashing-light signals at pathway and sidewalk grade crossings. FHWA proposes the changes to provide uniformity in the design and operation of flashing-light signals.

FHWA also proposes a new Guidance statement for use of pedestrian gates in situations where flashing-light signals have not been effective. FHWA proposes the change to improve pedestrian safety at pathway and sidewalk grade crossings.

Finally, FHWA also proposes changes to an existing Guidance statement to clarify that flashing-light signals are recommended along semi-exclusive LRT alignments. FHWA proposes the change to improve pedestrian safety at LRT grade crossings which typically have much higher volumes of pedestrians and rail traffic.

580. FHWA proposes a new section numbered and titled, “Section 8E.09 Active Traffic Control Devices—Automatic Pedestrian Gates,” for the design, utilization, and implementation of automatic pedestrian gates including accompanying figures. Some of the material in this section was relocated from existing Section 8D.06 and has been reorganized to provide all relevant information for automatic gates at pathway and sidewalk grade crossings in one section.

FHWA proposes a new Standard statement to require automatic pedestrian gates, swing gates and fencing for pathway and sidewalk grade crossings where trains are permitted to travel 80 miles per hour and higher.

FHWA proposes this change for pedestrian safety at grade crossings where higher speed trains operate.

FHWA also proposes a new Guidance statement to recommend an emergency escape route at automatic pedestrian gates. FHWA proposes this change to reflect industry best practices in the design of automatic pedestrian gates.

FHWA also proposes new Standards to require at least one red light on the automatic pedestrian gate arm and if there is more than one red light, they must be flashed in an alternating pattern. FHWA also proposes a new Option to omit the red light if the pathway or sidewalk crossing is within 25 feet of the roadway grade crossing. FHWA proposes this change for consistency with Section 8D.03, while providing agencies flexibility where the pathway or sidewalk grade crossing is in close proximity to automatic gates for the roadway grade crossing.

FHWA also proposes a new Option statement to clarify that a separate pedestrian gate is not required if the vehicular gate mechanism does not allow it to be raised by a pedestrian raising the pedestrian gate arm based on Official Ruling No. 8(09)–3(I).¹²⁶

Finally, FHWA proposes new Option and Guidance statements to provide information about the use of horizontal hanging bars from a pedestrian gate arm.

581. FHWA proposes a new section numbered and titled, “Section 8E.10 Active Traffic Control Devices—Multiple-Track Pathway or Sidewalk Grade Crossing” that contains the first sentence of P1 in existing Section 8C.13.

Discussion of Proposed Amendments to Part 9 Traffic Control for Bicycle Facilities

582. FHWA proposes to consolidate existing Sections 9A.02 through 9A.04 into one section numbered and retitled, “Section 9A.01 General.” This section provides an overview of traffic control devices on bicycle facilities and describes some of the benefits and limitations thereof.

583. FHWA proposes to remove existing Sections 9A.01, 9A.05, 9A.06, 9A.07, and 9A.08 because they are not needed.

584. FHWA proposes to replace and retitle Section 9A.02 “Standardization of Application for Signing,” which includes Standard, Guidance, and Option statements from existing Sections 9B.01 and 9B.02. FHWA proposes to change P4 and P5 in

¹²⁶ FHWA Official Ruling No. 8(09)–3(I), August 24, 2010, can be viewed at the following internet website: https://mutcd.fhwa.dot.gov/resources/interpretations/8_09_3.htm.

existing Section 9B.01 from Standard to Guidance to provide agencies the discretion in placement of sign supports to accommodate field conditions that may require modifications during design or sign installation.

Lastly, FHWA also proposes to add an Option statement allowing 18" x 18" warning signs that are only applicable to bicyclists and pedestrians. FHWA proposes this change to allow agencies to use smaller signs where appropriate.

585. FHWA proposes to relocate and consolidate existing Sections 9C.01 and 9C.02 into a replaced and retitled, Section 9A.03 "Standardization of Application for Markings." FHWA also proposes to remove Guidance about using bikeway design guides because the sentence did not provide any specific information.

FHWA also proposes to modify the existing Standard in Section 9C.02 requiring reflectorized markings on bikeways to require that pavement markings on bicycle facilities that must be visible at night be retroreflective unless the pavement markings are visible under provided lighting. FHWA proposes this change to clarify when retroreflectivity is required.

FHWA also proposes to add new Guidance paragraphs discouraging raised pavement markers with bicycle lanes or shared-use paths and also recommending that if raised pavement markers used around bicycle facilities that they are not immediately adjacent to the travel path of bicycles. FHWA proposes this Guidance because raised pavement markers create collision potential for bicyclists by placing fixed objects immediately adjacent to the travel path of the bicyclist.

586. FHWA proposes to separate existing Chapter 9B Signs into three chapters—retitle Chapter 9B to "Regulatory Signs," add a new Chapter 9C "Warning Signs and Object Markers," and add a new Chapter 9D "Guide and Service Signs." In addition, FHWA proposes to separate Table 9B-1 Bicycle Facility Sign and Plaque Minimum Sizes into three tables—Table 9B-1 for regulatory signs, Table 9C-1 for warning signs and object markers, and Table 9D-1 for guide and service signs. These changes are for consistency with how signs are organized in Part 2 and to make it easier to locate bicycle-related signs by sign type.

587. In Section 9B.01 (existing Section 9B.03) STOP and YIELD Signs (R1-1, R1-2), FHWA proposes adding a Standard that prohibits a STOP sign or a YIELD sign from being installed in conjunction with a bicycle signal face. FHWA proposes this restriction to provide uniformity in the application of

signals and to avoid conflicts between bicycle signal indications and signs.

588. FHWA proposes to add a new section numbered and titled, "Section 9B.02 Except Bicycles Plaque (R3-7bP)." This section describes the use of this plaque for circumstances where bicycles are exempt from regulatory restrictions that apply to other traffic. FHWA proposes new Standard paragraphs to prevent Except Bicycles Plaques from conflicting with STOP signs or YIELD signs and requires the plaques to be placed below the regulatory sign that it supplements. FHWA also proposes new Figure 9B-1 to show examples of how the Except Bicycles Plaque can be applied. FHWA proposes this new section because there are circumstances where it is appropriate to exempt bicyclists from regulatory restrictions applied to other traffic.

589. FHWA proposes to add a new section numbered and titled, "Section 9B.03 Advance Intersection Lane Control Signs for Bicycle Lanes (R3-8 Series)" to provide Standard, Guidance, Option, and Support statements for accommodating bicycle lanes on the R3-8 series of signing where determined to be appropriate. FHWA proposes this new section because improper dissemination of this information can result in unwieldy sign designs or legends. The amount of information that can be legibly displayed and comprehended by road users on signs or in signing sequence on the same approach to an intersection is limited. The number and combination of permissible movements by both the motor vehicle and the bicycle may be numerous, thereby complicating the cognitive task of the road user at a decision point.

590. In Section 9B.04, retitled, "Bike Lane Signs and Plaques (R3-17, R3-17aP, R3-5hP)," FHWA proposes changing a portion of the existing Guidance regarding the placement of Bike Lane signs and plaques periodically along the bicycle lane to an Option in order to give agencies the discretion of sign placement when developing a policy for the use of Bike Lane signs. As part of this change, FHWA also proposes to allow the use of other regulatory plaques such as BEGIN (M4-14) and END (M4-6) with Bike Lane signs.

FHWA also proposes adding Option statements allowing the use of a BIKE LANE plaque to supplement Mandatory Movement Lane Control signs in places where only a single bicycle movement is permitted from the bicycle lane and to supplement Optional Movement Lane Control signs where two or more

movements from a bicycle lane are permitted in order to prevent operational problems. FHWA proposes these additional statements to provide uniformity in signing.

591. In Section 9B.08 (existing Section 9B.09) Selective Exclusion Signs, FHWA proposes the deletion of the Standard requiring that Selective Exclusion signs clearly indicate the type of traffic that is excluded. FHWA proposes this change, because the Selective Exclusion signs specify the user type, therefore a separate Standard statement is not necessary.

592. FHWA proposes to add a new section numbered and titled, "Section 9B.10 Back-In Parking Sign (R7-10)." This section provides Option and Support statements and a figure regarding the application of the proposed new R7-10 sign, which may be used where back-in angle parking is required by motor vehicles due to the presence of a bike lane.

593. In Section 9B.11, retitled, "Bicycles Use Ped Signal (R9-5)," FHWA proposes a new Option to remind drivers making turns that a Turning Vehicles Yield to Pedestrians (R10-15) or Left Turns Yield to Bicycles (R10-12b) sign may be used. Also, to increase uniformity in placement location, FHWA proposes new Guidance for the location and installation of the R9-5 sign to recommend placement where bicyclists cross the street.

594. FHWA proposes to add a new section numbered and titled, "Section 9B.12 Bicycles Yield to Peds Sign (R9-6)." While this sign exists in Section 9B.11 of the 2009 MUTCD, FHWA proposes to add additional Standard paragraphs regarding the application and use of this sign, along with a new figure, to provide practitioners with additional information and to promote uniformity in its use.

595. In Section 9B.14 (existing Section 9B.06), FHWA proposes to change the legend of the existing R4-11 (Bicycles May Use Full Lane) sign to "Bicycles Allowed Use of Full Lane." The standardized sizes of the sign would not change and the proposed legend would continue to be of commensurate size for its application, ensuring adequate levels of legibility and recognition. FHWA proposes this change because the legend of the existing sign, which was introduced in the 2009 edition of the MUTCD, conveys a warning message on a regulatory sign while the proposed legend would be consistent with regulatory signs that display notification of vehicle codes governing rules of the road.

In addition to this change, FHWA proposes to redesignate this sign from R4–11 to R9–20. FHWA proposes this change to group this sign with several other proposed bicycle-related signs with the R9 series designations.

596. FHWA proposes to add a new section numbered and titled, “Section 9B.15 Bicycle Passing Clearance Sign (R4–19)” to describe the use of this proposed new sign.

Option and Guidance paragraphs are added to provide details on the use and restrictions of this sign that is only allowed in jurisdictions that have passed a law or ordinance specifying a specific passing clearance.

597. FHWA proposes to add a new section numbered and titled, “Section 9B.16 Bicycles Use Shoulder Only Sign (R9–21)” to describe the use of this proposed new sign that is an option to use on freeways or expressways. Also, FHWA proposes a new plaque R5–10dP that is an option to use on freeways to prohibit bicycles on ramps leading to an adjacent or parallel freeway. The Guidance provided in this section proposes that the Bicycles Use Shoulder Only sign (R9–21) only be placed adjacent to the on-ramp or entrance to the freeway at or near the location where the full-width should resume beyond the entrance ramp taper. FHWA proposes this sign because there are places where bicycles are permitted on a freeway but are required to travel on an available and usable shoulder.

598. FHWA proposes to add a new section numbered and titled, “Section 9B.17 Signing for Bicycles on Freeways and Expressways” to provide Standard, Option, and Support paragraphs along with a new figure, for bicycle signing on freeways and expressways. FHWA proposes to add a new Bicycles Must Exit (R9–22) sign that is required in advance of a location where a freeway or expressway becomes prohibited to bicycle travel. FHWA also proposes a new Standard requiring the No Bicycling Sign (R5–6) be placed downstream from the ramp departure point where the prohibited segment of freeway or expressway begins. FHWA proposes this new section to provide uniformity in signing for bicycles on freeways and expressways.

599. FHWA proposes to add a new section numbered and titled, “Section 9B.18 Two-Stage Bicycle Turn Box Regulatory Signing (R9–23 series).” FHWA proposes Standard, Option, and Support for the new sign as well as a new Figure 9B–5 that illustrates required signing for two-stage turn boxes that are used to simplify the turning task for bicyclists at certain intersections.

600. FHWA proposes to add a new section numbered and titled, “Section 9B.19 Bicycle Jughandle Signs (R9–24, R9–25, R9–26, and R9–27 Series).” FHWA proposes the new section to define a bicycle jughandle turn and provide Guidance, Option, and Support, as well as a new Figure 9B–6, that illustrates signing for such locations.

601. FHWA proposes to add a new section numbered and titled, “Section 9B.20 Bicycle Actuation Signs (R10–4, R10–22, R10–24, R10–25, and R10–26),” created from paragraphs in existing Section 9B.11 and Section 9B.13. FHWA proposes to rename sign R10–22 from “Bicycle Signal Actuation” to “Bicycle Detector.” Also, FHWA proposes to add a Guidance paragraph giving recommendations on where to place Bicycle Detector signs.

602. FHWA proposes to add a new section numbered and titled, “Section 9B.21 LEFT TURN YIELD TO Bicycles Sign (R10–12b)” to provide information regarding the proposed new R10–12b sign and refers the user to Section 2B.53. FHWA proposes this change because road users approaching a signalized intersection with opposing counter-flow bicycle lanes may not expect to yield to oncoming bicycles.

603. FHWA proposes to add a new section numbered and titled, “Section 9B.22 Bicycle SIGNAL Signs (R10–40, R10–40a, R10–41, R10–41a, R10–41b).” FHWA proposes this new section in concert with the addition of bicycle signal faces in the MUTCD. The proposed Standard in this section requires that a Bicycle Signal sign be installed immediately adjacent to every bicycle signal face to inform road users that the specialized signal control face is intended only for bicyclists. FHWA proposes this new section to be consistent with past FHWA action and proposed changes to Part 4 to establish uniform signal control indications for bicycles on a national basis, which would improve bicyclist safety, especially at locations where separate signal phases are provided for motor-vehicle and bicycle traffic.

604. In Section 9B.23 (existing Section 8.17) LOOK Sign (R15–8), FHWA proposes to relocate this section from Part 8 and allow the use of a LOOK sign on a shared-use path or separated bikeway at a railroad or LRT grade crossing.

605. FHWA proposes to add a new section numbered and titled, “Section 9B.25 General Service Signing for Bikeways” to provide information regarding General Service signs and their applicability for bicycles as referenced in Chapter 2I.

606. FHWA proposes to add a new section numbered and titled, “Section 9C.05 Except Bicycles Plaque (W16–20P)” to provide information regarding a proposed new plaque that can be used to notify bicyclists that a warning sign is not applicable to them.

607. FHWA proposes to add a new section numbered and titled, “Section 9C.06 Bicycle Cross Traffic Warning Plaques (W16–21P, W21–16aP)” to provide information regarding a proposed new plaque recommended for use below a STOP sign in isolated locations to alert motor vehicles of unexpected bicycle traffic.

608. FHWA proposes to add a new section numbered and titled, “Section 9C.07 Bicycle Lane Ends Warning Sign (W9–5) and Bicycle Merging Sign (W9–5a)” to provide Support, Option, and Guidance for two new signs, W9–5 and W9–5a that can be used to alert road users when a bicycle lane is ending or a bicycle merge is occurring.

609. In Section 9C.08 (existing Section 9B.19) Other Bicycle Warning Signs, FHWA proposes an Option to use a plaque displaying the legend IN ROAD (W16–1p and W16–1aP) with the Bicycle Warning Sign (W11–1) to communicate to bicycles and motor vehicles that bicycles are in the road. The SHARE THE ROAD plaque has been removed from the MUTCD based on research indicating that road users do not understand the intended message.

610. In Section 9C.09 (existing Section 9B.26) Object Markers, FHWA proposes to delete existing P3 and P4 regarding how markers are striped and instead reference Section 2C.69.

611. In Section 9D.01 (part of existing Section 9B.20), retitled, “Bicycle Destination Signs (D1–1b, D1–1c, D1–2b, D1–2c, D1–3b, D1–3c),” FHWA proposes to change the Guidance regarding the substitution of Bicycle Destination signs for vehicular destination signs to a Standard to be consistent with existing provisions in existing Section 9B.02. FHWA proposes this change to prohibit the use of smaller size Bicycle Destination signs when the message is also intended to be applicable to motorists as well as address an existing conflict in the MUTCD.

FHWA also proposes to add a new Support paragraph regarding the purpose of Bicycle Destination signs and example locations for placement.

FHWA also proposes to add an Option statement to permit Destination signs and Street Name signs to be installed instead of or in addition to Bicycle Destination signs if the

Destination or Street Name sign applies to motorists and bicyclists.

In addition, FHWA proposes to add an Option statement to permit the use of an oversized bicycle symbol as the top line of a Bicycle Destination sign instead of individual bicycle symbols for each of the destination/distance lines. FHWA proposes this option to facilitate legibility on these signs and in accordance with FHWA's Official Ruling No. 9(09)–20(I).¹²⁷

Also, FHWA proposes Guidance to clarify that the bicycle symbol should be to the left of the destination legend where the arrow is located at the extreme right.

Finally, FHWA proposes to add a Guidance statement to discourage displaying travel times on Bicycle Destination signs. FHWA proposes this recommendation because travel times vary greatly by bicycle user speed and experience. Further, in terms of bike travel, the travel time does not provide any useful information that a distance would not already provide.

612. FHWA proposes to create a new section numbered and titled, "Section 9D.02 BIKE ROUTE Guide Signs (D11–1, D11–1c, D11–1d, D11–1e, D11–1f, D11–1g)" that contains relocated paragraphs from existing Section 9B.20 and new D11–1d, D11–1e, D11–1f, and D11–1g signs. FHWA proposes to add these new signs to provide alternative layouts and eliminate the potential need for an additional, separate sign on the same post.

FHWA also proposes to add a Guidance statement to discourage displaying travel times on BIKE ROUTE Guide signs or Alternative BIKE ROUTE guide signs in concert with the proposed change in Section 9D.01 (existing Section 9B.20).

613. FHWA proposes to add a new section numbered and titled, "Section 9D.03 BIKE ROUTE Plaque (D11–1bP)" to provide two new Options for installing the D11–1bP plaque to supplement the Alternative BIKE ROUTE Guide (D11–1c) sign and a Street Name (D3–1) sign, in addition to the Option contained in P3 of existing Section 9B.25 to supplement the Bicycle Directional (D11–1a) sign. FHWA also proposes to add three new Standards regarding the use of the proposed new sign.

614. FHWA proposes to add a new section numbered and titled, "Section 9D.04 Numbered Bikeway Systems" to provide Support, Guidance, Standard,

and Option statements, as well as a new Figure 9D–3, describing the proper signing for numbered bicycle routes. FHWA proposes this new section to provide uniformity in the numbering and signing of bicycle route systems.

615. In Section 9D.05 (existing Section 9B.21), retitled, "Numbered Bicycle Route Signs (M1–8, M1–8a)," FHWA proposes a new Standard to require a bicycle symbol when the Numbered Bicycle Route (M1–8, M1–8a) sign is used on a roadway so that the bicycle route can be distinguished from other numbered route systems. FHWA also proposes new Guidance to clarify the dimensions and placement of use of a pictograph, if used, on these signs.

FHWA also proposes to relocate text related to U.S. Bicycle Route (M1–9) signs to new Sections 9D.02, 9D.04, and 9D.07.

616. FHWA proposes to add a new section numbered and titled, "Section 9D.06 Non-Numbered Bicycle Route Sign (M1–8b, M1–8c)" to provide Support, Option, Standard, and Guidance statements on the use and design of the Non-Numbered Bicycle Route (M1–8b, M1–8c) sign. FHWA proposes this new section to provide information for signing bicycle routes that are designated specifically by name or established using a distinctive route identity but are excluded from a numbered route system.

617. FHWA proposes to add a new section numbered and titled, "Section 9D.07 U.S. Bicycle Route Sign (M1–9)" containing paragraphs from existing Section 9B.21. FHWA also proposes to change the M1–9 sign layout in accordance with FHWA Interim Approval IA–15.¹²⁸

618. In Section 9D.08 (existing Section 9B.22) Bicycle Route Sign Auxiliary Plaques, FHWA proposes a new Standard to require the route sign and auxiliary plaques for bikeways to be installed on independent assemblies if a designated or numbered bicycle route is concurrent with a numbered highway. FHWA proposes this change to minimize road user confusion in route signing.

FHWA also proposes to add a Standard prohibiting installing route signs for bikeways on guide signs or overhead because these signs are typically intended for motorists and bicyclists may not expect or be able to view the legends.

In addition, FHWA proposes to add an Option permitting route assemblies

for a designated or numbered bicycle route to be installed at locations and distances other than those prescribed in Chapter 2B based on FHWA's Official Ruling No. 9(09)–39(I).¹²⁹

Also, FHWA proposes adding clarification to the Guidance paragraph regarding the M4–8 plaque and that the sign color should match the color combination of the route for uniformity. FHWA proposes a new Guidance paragraph regarding minimum route sign sizes to improve visibility.

FHWA also proposes a new Standard to require the Junction, Cardinal Direction, or Alternative Route auxiliary plaque be installed above the Bicycle Route sign, and the Advance Turn Arrow or Directional Arrow auxiliary plaque be installed below the Bicycle Route sign where both are used on the same sign assembly. FHWA proposes this new section to provide uniformity in placement of auxiliary plaques on sign assemblies.

Also, FHWA proposes to delete the Option statement regarding destination sign mounting because it is redundant with Paragraph 4 of existing Section 9D.20.

FHWA proposes a new Standard regarding the usage of Bicycle Route Sign assembly that shall consist of a route sign and auxiliary sign. FHWA proposes this new Standard to improve uniformity and for consistency with provisions for other Route Sign assemblies, which provide positive direction to road users.

Also, FHWA proposes Guidance to clarify that Bicycle Route Sign assemblies should be installed on all approaches where bicycle routes meet other bicycle routes. This Guidance would improve bicycle network wayfinding.

In addition, FHWA proposes new a Standard regarding the arrangement of information displayed on groups of assemblies for bicycle routes to improve uniformity and consistency with existing provisions for other types of assemblies, which facilitates recognition by the road user. FHWA proposes a new Option allowing Bicycle Route Sign assemblies to be installed on common supports with numbered highway routes to reduce sign clutter.

Also, FHWA proposes new Standard and Option statements for the required signing of the Junction assembly and the optional placement in advance of an intersection to improvement uniformity and wayfinding for bicyclists.

¹²⁷ FHWA's Official Ruling No. 9(09)–20(I), July 29, 2011, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/9_09_20.htm.

¹²⁸ FHWA's Interim Approval IA–15, June 1, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interim_approval/ia15/index.htm.

¹²⁹ FHWA's Official Ruling No. 9(09)–39(I), December 26, 2012, can be viewed at the following internet website: http://mutcd.fhwa.dot.gov/resources/interpretations/9_09_39.htm.

Finally, FHWA proposes new Standard, Guidance, Option, and Support statements for bicycle route signs regarding the use and layout of Directional signs or Directional assemblies to improve uniformity and wayfinding for bicyclists.

619. In Section 9D.09 (existing Section 9B.23), retitled, “Bicycle Parking Signs (D4–3, D4–4),” FHWA proposes to delete the Standard regarding the color of the legend and border because the color for guide signs is covered elsewhere.

FHWA also proposes to add an Option permitting a new Bicycle-Sharing Station (D4–4) sign to be installed to provide directional information to a designated bicycle sharing system. FHWA proposes to add a Guidance recommending that, if used, the Bicycle-Sharing Station sign should be used in conjunction with a regulated bicycle-sharing system. FHWA proposes these changes to establish uniformity with signing for these new bicycle facilities.

In addition, FHWA proposes to add a new Standard reiterating existing prohibitions on promotional advertising, business logos, or other identification that would convey the involvement of a public-private partnership, in accordance with the existing provisions of Section 1A.02 that prohibit promotional advertising on traffic control devices.

620. In Section 9D.10 (existing Section 9B.24) Reference Location Signs (D10–1 through D10–3) and Intermediate Reference Location Signs (D10–1a through D10–3a), FHWA proposes to delete existing Standard P5 regarding the design of reference location signs because minimum sign sizes are specified in the existing table and sign designs are standardized and must comply with the existing provisions of Chapter 2A.

FHWA also proposes to change existing P4 and P6 regarding the use of decimal points and a zero numeral on the integer mile point on intermediate reference location signs and the placement of reference location signs from a Standard to a Guidance to provide agencies flexibility in mile point displays and sign placement.

621. FHWA proposes to add a new section numbered and titled, “Section 9D.12 Destination Guide Signs for Shared-Use Paths (D11–10a, D11–10b, D11–10c)” to provide Support, Standard, Guidance, and Option statements regarding the application of Destination Guide signs for shared-use paths. FHWA proposes new Standards that require the destination guide signs on shared-use paths, when used, to be

retroreflective and limits the use of symbols to allowable modes on the path. FHWA also proposes new Standards related to sign content and layout requirements, including arrows, lettering, and pictographs. FHWA proposes this new section to provide practitioners information for shared-use path signing, the need for which has increased in recent years, as evidenced by an increasing number of technical inquiries that FHWA has answered regarding this type of signing.

622. FHWA proposes to add a new section numbered and titled, “Section 9D.13 Two-Stage Bicycle Turn Box Guide Signing (D11–20 series)” with Standard, Option, and Support statements related to the use of the guide signs for two-stage bicycle turn boxes. FHWA also proposes a new Figure 9D–6 that illustrates the guide signing for two-stage turn boxes that are used to simplify the turning task for bicyclists at certain intersections.

623. In Section 9E.01 (part of existing Section 9C.04), retitled, “Bicycle Lanes,” FHWA proposes to revise the Standard to require the use of bicycle lane symbol or word markings, in addition to longitudinal pavement markings, to define bicycle lanes. In concert with this change, FHWA proposes to add an Option statement permitting the use of the word marking BIKE LANE as an alternative to the bicycle symbol. FHWA proposes these changes to inform road users of the bicycle lane and to reduce wrong-way bicycling.

In addition, FHWA proposes adding clarification to the Guidance regarding the placement of the first symbol or word denoting a bicycle lane. This proposed change makes the bicycle markings consistent with preferential lane word and symbol markings.

FHWA also proposes a new Option allowing the use of arrow markings in conjunction with the bicycle lane symbol or word markings.

Finally, FHWA proposes to add a Standard prohibiting the bicycle symbol or BIKE LANE pavement word marking and the pavement marking arrow in a shoulder. FHWA also proposes to require that a portion of the travel way cannot be established as both a shoulder and a bicycle lane because each serves a different use and has differing regulations that apply. The uniform marking of each type would minimize any confusion and accommodate the expectancy of the road user.

624. FHWA proposes a new section numbered and titled, “Section 9E.02 Bicycle Lanes at Intersection Approaches,” which contains material from existing Section 9C.04.

FHWA proposes a new Option statement to allow a bicycle lane to be located on the outside of a turn lane if a bicycle signal face is used and the signal phasing and signing eliminates potential conflicts.

FHWA also proposes a new Standard that requires bicycle lanes located at an intersection approach between contiguous lanes for motor vehicle movements be marked with a bicycle symbol and arrow pavement markings. FHWA also proposes a Standard to prohibit bicycle lanes from being marked as contiguous with a general purpose turn lane, either with dotted or any other line markings. FHWA proposes these additions to alert motor vehicles of the presence of bicyclists and prevent potential conflicts.

In addition, FHWA proposes Option, Guidance, and Support statements for shifting over of buffer separated or separated bike lanes at intersections to improve visibility for motor vehicles and bicycles to account for developments in bicycle facility design since 2009 edition of the MUTCD.

Finally, FHWA proposes new Option, Standard, and Support statements and a new figure to provide an option and requirements for the use of mixing zones, which are when general purpose and bike lanes must share the same space through an intersection.

625. FHWA proposes a new section numbered and titled, “Section 9E.03 Extensions of Bicycle Lanes through Intersections” to provide Support, Standard, Guidance, and Option statements on the application of bicycle lane extensions. In this section, FHWA proposes to clarify that shared-lane markings and chevrons shall not be used through intersections. This is not a new Standard, rather a clarification of the Standard in existing Section 9C.07 and of the use of chevrons. FHWA proposes new Standard statements requiring only dotted lane lines for extensions of bike lanes through intersections, and requiring lane extension markings to extend buffer-separated or separated bicycle lanes through intersections and driveways. As part of these changes, FHWA proposes Support and Guidance statements regarding pavement markings for bicycle lanes through intersections. FHWA also adds a Standard requiring the lateral limits of bicycle lane extensions through intersections when the bicycle lane is contiguous to a crosswalk. FHWA proposes this new section because the uniform application of extensions of bicycle lanes through intersections assists all users of the intersection in identifying where bicyclists are expected to operate.

626. FHWA proposes a new section numbered and titled, “Section 9E.04 Bicycle Lanes at Driveways” to provide options for bicycle lanes at or through driveways. FHWA proposes this new section to provide practitioners with options for marking bicycle lanes in the vicinity of driveways and to promote the uniform application of these treatments.

627. FHWA proposes a new section numbered and titled, “Section 9E.05 Bicycle Lanes at Circular Intersections,” which contains material relocated from existing section 9C.04. FHWA proposes additional Support statements related to the use of shared-lane markings and bicycles on the sidewalk at circular intersections, since bicycle lanes are already prohibited through circular intersections.

628. FHWA proposes a new section numbered and titled, “Section 9E.06 Buffer-Separated Bicycle Lanes” to provide practitioners with Support, Standard, Guidance, and Option statements and a new figure to provide information on the application of buffer-separated bicycle lanes. FHWA proposes new Standards that provide requirements on the buffer-separated bicycle lines, including line types, markings in the buffer, width, location, and color. FHWA proposes this new section and associated figure, because providing a buffer space between a bicycle lane and a travel lane can reduce vehicle encroachment into the bicycle lane and reduce crashes between a bicyclist and open vehicle doors in a parking lane. In addition, the provisions of this Section would promote uniformity in the use of this treatment in accordance with existing traffic control devices in Section 3B.25 (existing Section 3B.24) and Chapter 3E (existing Chapter 3D).

629. FHWA proposes a new section numbered and titled, “Section 9E.07 Separated Bicycle Lanes” to provide Support, Standard, Option, and Guidance statements, along with a new figure, for the application of separated bicycle lanes. FHWA proposes Standard statements requiring a buffer space between parking spaces and separated bicycle lanes, buffer space markings, restrictions for edge line and lane line colors, and requiring directional arrows. FHWA also proposes Standards related to requirements for signalization with two-way separated bicycle lanes and prohibiting right turns on red across separated bicycle lanes when bicycle traffic is allowed to proceed through the intersection. FHWA proposes this new section to provide practitioners information for uniformity in application to promote the safe and

efficient operation of the bicycle lanes by reducing conflicts between bicycles and pedestrians accessing parked vehicles, and between bicycles and motor vehicles turning across their path on separate traffic signal phases.

630. FHWA proposes a new section numbered and titled, “Section 9E.08 Counter-Flow Bicycle Lanes” to provide Support, Standard, and Guidance statements, along with a new figure, for the application of counter-flow bicycle lanes, which is when one direction bicycle lanes travel the opposite direction of the general traffic that is also traveling in one direction. FHWA proposes Guidance to recommend that a counter-flow bicycle lane be placed on the right-hand side of the road with opposing traffic on the left.

FHWA also proposes a Standard requiring double yellow line markings, a painted median island, raised median island, or some form of physical separation to define the counter-flow bicycle lane where the speed limit is 30 mph or less. When the speed limit is 35 mph or greater, FHWA proposes a Standard requiring a buffer, a painted median, raised median island, or another form of physical separation to ensure safe operation through adequate separation between opposing flows of bicycles and motor vehicles.

Lastly, FHWA proposes new Standards and Guidance for required and recommended signing and signalization for counter-flow bicycle lanes. FHWA proposes this new section to provide practitioners information for uniformity in application.

631. In Section 9E.09 (existing Section 9C.07) Shared-Lane Marking, FHWA proposes to revise the Guidance to recommend that shared-lane markings not be used on roadways with a posted speed limit of 40 mph or above, instead of 35 mph or above per the 2009 version of the Manual.

FHWA also proposes to revise the Standard to expand the listing of locations where shared-lane markings are prohibited. FHWA proposes this change to include some of the new applications that are proposed in this NPA but are not in the 2009 Edition of the Manual, and to address field experience with this marking since it was adopted in the 2009 MUTCD.

In addition, FHWA provides new Guidance statements on the placement of shared-lane markings and the use of Bicycles Allowed Use of Full Lane (R9–20, redesignated from R4–11) signs.

Lastly, FHWA proposes new Options and an associated figure, for implementation of shared-lane markings in places where the width of the roadway is insufficient to continue a

bike lane or separate bikeway on approach to the intersection. FHWA proposes this new section to provide practitioners discretion when developing a policy for the use of the shared-lane markings on intersection approaches.

632. FHWA proposes a new section numbered and titled, “Section 9E.10 Shared-Lane Markings for Circular Intersections” to provide Guidance and Support statements recommending that shared-lane markings not be used in the circulatory roadway of multi-lane circular intersections. FHWA proposes this new section to assist practitioners with providing uniform treatments of shared-use paths in the vicinity of circular intersections based on an NCHRP study.¹³⁰

633. FHWA proposes a new section numbered and titled, “Section 9E.11 Two-Stage Bicycle Turn Boxes” to provide Support, Standard, Option, and Guidance statements, as well as two new figures, to describe the application of two-stage bicycle turn boxes. FHWA proposes Standards to provide requirements on location, pavement markings, arrows, and passive detection of bicycles at traffic signals. As two-stage bicycle turn boxes are intended to be positioned within an intersection for bicyclists to queue safely, these Standards define what is required to make those spaces both safe and operationally effective for bicyclists at traffic signals.

In addition, FHWA proposes Guidance to consider the peak hour bicycle demand and adjacent land uses for the size of the bicycle turn box.

FHWA also proposes an Option to use green colored pavement with an associated Standard that requires the entire turn box to be green colored pavement when used.

Lastly, FHWA proposes a Standard that requires a full-time turns-on-red prohibition where the path of vehicles lawfully turning right on red would pass through the bicycle turn box. FHWA proposes this section to describe the proper use of this new application that simplifies the turning task for bicyclists.

634. FHWA proposes a new section numbered and titled, “Section 9E.12 Bicycle Box” to provide Option, Standard, Guidance, and Support statements and a new figure, to describe the application of a bicycle box.

FHWA also proposes Guidance recommending consideration of motor vehicle and bicycle conflicts for when

¹³⁰ “Roundabouts: An Informational Guide, Second Edition” NCHRP 672, 2010, can be viewed at the following internet website: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_672.pdf.

the bicycle box should be used, recommending that a bicycle lane be used on the approach to a bicycle box, and recommending that a bicycle box not be contiguous with a crosswalk.

In addition, FHWA proposes Standards requiring locations, markings, signal yellow change and red clearance intervals, and countdown pedestrian signals when the bicycle box extends across more than one approach lane of motor vehicles. FHWA proposes these changes to mitigate the potential conflict between bicyclists crossing a bicycle box across multiple lanes while motor vehicle traffic is given a green indication to move into the intersection.

Lastly, FHWA also proposes an Option to use green colored pavement with an associated Standard that requires the entire bicycle box to be green colored pavement when used. FHWA proposes this addition to describe the proper use of this new application that increases the visibility of stopped bicyclists on the approach to a signalized intersection when the signal is red.

635. In Section 9E.13 (existing Section 9C.03), retitled, “Shared-Use Paths,” FHWA proposes a new Option and Standard, and accompanying figure, to provide additional design options for pavement markings.

FHWA also proposes a new Guidance that the crossing areas for bicyclists should use green-colored pavement in order to distinguish between the crosswalk for pedestrians and the crossing area for bicyclists. FHWA proposes this new Guidance in concert with the proposal to add green-colored pavement for bicycle facilities.

636. FHWA proposes a new section numbered and titled, “Section 9E.14 Bicycle Route Pavement Markings” to provide Option, Standard, and Guidance statements, as well as a new figure, for the application of pavement markings to simulate route auxiliary plaques and Bicycle Route Guide signs to provide navigational guidance for bicyclists and pedestrians on shared-use paths, separated bikeways on independent alignment, and on improved trails.

Also, FHWA proposes Standards to limit the use of route markers on bicycle lanes, separated bikeways in the roadway, or on roadways where the shared-use path runs contiguous or concurrent with a street or highway.

Lastly, FHWA also proposes a Guidance to require that pavement markings simulating official guide signs for bicycle routes be supplemental to the sign(s) and shall not be a substitute for the sign(s), with an associated Guidance that recommends a systematic

methodology of locating signs and bicycle route pavement markings. FHWA proposes this new section to provide uniformity for this new practice.

637. In Section 9E.15 (existing Section 9C.05) Bicycle Detector Symbol, FHWA proposes the addition of an Option statement that allows WAIT HERE FOR GREEN word markings to be placed on the pavement immediately below the bicycle detector symbol to help bicyclists know to stop on the bicycle detector symbol.

638. FHWA proposes a new section numbered and titled, “Section 9E.17 Raised Devices” to provide Support, Option, Standard, and Guidance statements for the application of raised devices in coordination with bicycle facilities. FHWA proposes a Standard that channelizing devices shall not incorporate the color green, consistent with an existing requirement in Part 3 that the color of channelizing devices shall match the color of the pavement markings they supplement. FHWA proposes this requirement to reiterate the existing requirement because some bicycle facilities utilize optional green-colored pavement to supplement the required white or yellow markings and the existing requirement could imply that the color of the channelizing devices are allowed to match the color of the pavement (green, in this case) rather than the color of the pavement marking. FHWA proposes this change as a conforming edit, which would not change the existing underlying requirement.

FHWA also proposes Guidance statements that the channelizing devices should be tubular markers, and that the selection of a raised device consider the collision potential of both the post and the base.

Lastly, FHWA proposes Guidance to recommend that if used in buffer-separated bicycle lanes, channelizing devices should be placed in the buffer space and at least one foot from the longitudinal bicycle lane pavement marking. FHWA proposes this new section because the purpose of channelizing devices is to emphasize pavement marking patterns associated with bicycle facilities.

639. FHWA proposes a new section numbered and titled, “Section 9F.02 Bicycle Signal Face” to provide a reference to Chapter 4H on the design and application of bicycle signal faces and Section 9B.22 for the Bicycle SIGNAL sign.

640. FHWA proposes a new chapter numbered and titled, “Chapter 9G Bicycle Accommodations at Alternative Intersections.” This new chapter

contains six proposed new sections numbered and titled as follows: “Section 9G.01 General,” “Section 9G.02 Displaced Left-Turn Intersection,” “Section 9G.03 Median U-Turn Intersection,” “Section 9G.04 Intercepted Crossroad Intersection,” “Section 9G.05 Restricted Crossing Intersection,” and “Section 9G.06 Diamond Interchange with Transposed-Alignment Crossroad” to provide practitioners with information on how to accommodate bicyclists through these various types of alternate intersections. FHWA also proposes four new figures demonstrating examples of the bicycle accommodations at alternative intersections. The information in these proposed sections, along with the accompanying figures, are based on supporting research.¹³¹

641. In proposed Section 9G.01 General, FHWA proposes a Support that clarifies that the Chapter describes examples for the application and accommodation of bicycle traffic at alternative intersections but is not a requirement to provide the bicycle traffic control herein.

642. In proposed Section 9G.02 Displaced Left Turn Intersection, FHWA proposes Guidance to recommend that a left-turning bicycle movement should transition to an independent alignment that facilitates the bicycle to a two-stage turn box where bicycle lanes or shared-lane markings are used on the major street approaching a displaced left-turn intersection.

643. In proposed Section 9G.03 Median U-turn Intersection, FHWA recommends Guidance that a two-stage bicycle turn box should be used where left-turning bicycles need to be accommodated at median U-Turn intersections.

644. In proposed Section 9G.04 Intercepted Crossroad Intersection, FHWA recommends Guidance that shared-lane markings should be discontinued on a single lane intersection approach on cross streets and the bicycle movement should be transitioned to a bicycle lane contiguous to the exclusive right or left turn lane for motor vehicles.

645. In proposed Section 9G.05 Restricted Crossing Intersection, FHWA proposes Guidance to recommend that bicycle destination or bicycle route guide signs should be used at restricted crossing intersections where it is demonstrated that it would be difficult for bicycle movements.

¹³¹ “Alternative Intersections/Interchanges: Informational Report (AIR)” FHWA-HRT-09-060, April 2010, can be viewed at the following internet website: <http://www.fhwa.dot.gov/publications/research/safety/09060/09060.pdf>.

646. In proposed Section 9G.06 Diamond Interchange with Transposed-Alignment Crossroad, FHWA proposes Guidance to recommend destination guide signs for shared-use paths to transition pedestrian and bicycle travel to and from the median of the transposed alignment where a shared-use path is used.

647. In Appendix A1, FHWA proposes to retitle the section to “Congressional Actions” and add a new option to allow an alternative letter style for destination legends on freeway and expressway guide signs. For clarity in application, FHWA designates this letter style, commonly referred to as “Clearview 5–W,” as “Series E (modified)—Alternative.” In concert with this change, FHWA proposes a Standard provision to define the applicability and scope of this letter style because the design criteria differ from those of the Standard Alphabets. FHWA proposes these provisions to address the operational effect of the Consolidated Appropriations Act of 2018 that required FHWA to, “. . . reinstate Interim Approval IA–5, relating to the provisional use of an alternative lettering style on certain highway guide signs, as it existed before its termination, as announced in the **Federal Register** on January 25, 2016 (81 FR 4083).” FHWA requests comments on the proposed revisions to Appendix A1 as well as the proposal to add “Series E (modified)—Alternative” to Appendix A1.

FHWA granted Interim Approval (IA–5) to use Clearview 5–W in certain applications on September 2, 2004, based on early research that suggested improvements in sign legibility. FHWA rescinded this Interim Approval on January 25, 2016,¹³² after subsequent research and a more thorough review of the early research finding showed no discernable improvement. In addition, it became apparent that having a separate optional letter style with different design criteria caused confusion in sign design and layouts resulting in inappropriate and sometime ineffective signs. However, the Omnibus Appropriations Act, 2018 (section 125 of Division L) required FHWA to reinstate Interim Approval IA–5 for that fiscal year. In addition, the Joint Explanatory Statement House Report 115–237¹³³ directed FHWA to conduct

¹³² **Federal Register** notice of Interim Approval IA–5 rescission (81 FR 4083, Jan. 25, 2016) can be viewed at the following website: <https://www.govinfo.gov/content/pkg/FR-2016-01-25/html/2016-01383.htm>.

¹³³ The Joint Explanatory Statement House Report 115–237 can be viewed at the following website:

a comprehensive review of the research on this alternative font and report on the safety and cost implications of the decision while fully addressing the comments submitted by affected States during the December 13, 2016, Request for Information¹³⁴ related to the alternative font. FHWA reviewed the comments submitted and conducted a comprehensive analysis of all research identified as being associated with the alternative font and submitted the *Report on Highway Guide Sign Fonts*,¹³⁵ to Congress with the findings of these reviews. As a result of this Congressional action, FHWA reinstated Interim Approval IA–5 on March 18, 2018.¹³⁶ Though not required, Interim Approval IA–5 has been allowed to continue past the end of that fiscal year so that FHWA could request comments on potential inclusion of this alternative letter style as part of the MUTCD.

Discussion Under 1 CFR Part 51

FHWA is proposing to incorporate by reference the more current versions of the manuals listed herein.

FHWA’s 2009 “Manual on Uniform Traffic Control Devices for Streets and Highways,” including Revisions No. 1 and No. 2, dated May 2012 would be replaced with a more current edition the MUTCD. 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 proposing to incorporate 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 a proposed 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, SE, Washington, DC 20590. Further, the text, figures, and tables of a proposed new edition of the MUTCD incorporating changes from the current edition are available on the MUTCD website <http://>

<https://www.congress.gov/115/crpt/hrpt237/CRPT-115hrpt237.pdf>.

¹³⁴ The December 13, 2016, Request for Information on Clearview font (81 FR 89888, Dec. 13, 2016) can be viewed at the following website: <https://www.govinfo.gov/content/pkg/FR-2016-12-13/html/2016-29819.htm>.

¹³⁵ https://mutcd.fhwa.dot.gov/resources/interim_approval/ia5rptcongress/ia5rptcongress.pdf.

¹³⁶ Information on FHWA reinstatement of IA–5 can be viewed at the following website: https://mutcd.fhwa.dot.gov/res-interim_approvals.htm.

mutcd.fhwa.dot.gov. The proposed text is available in two formats. The first format shows the current MUTCD text with proposed additions in blue underlined text and proposed deletions as red strikeout text, and also includes notes in green boxes to provide helpful explanations where text is proposed to be relocated or where minor edits are proposed. The second format shows a “clean” version of the complete text proposed for the next edition of the MUTCD, with all the proposed changes incorporated. Though the proposed text, figures, and tables are available only as separate documents for inspection, all three elements will be integrated when the new edition of the MUTCD is published in a consistent format, similar to the current edition. The complete current 2009 edition of the MUTCD with Revision No. 1 and Revision No. 2 incorporated is also available on the same website. The specific standards are discussed in greater detail elsewhere in this preamble.

Executive Order 12866 (Regulatory Planning and Review), Executive Order 13563 (Improving Regulation and Regulatory Review), Executive Order 13771 (Reducing Regulations and Controlling Regulatory Costs), and 49 CFR Part 5 (DOT Rulemaking Procedures)

The proposed rule is a nonsignificant regulatory action within the meaning of Executive Order (E.O.) 12866 and DOT regulatory policies and procedures. This action complies with EOs 12866, 13563, and 13771 to improve regulation. These changes are not anticipated to affect adversely, in any material way, any sector of the economy. Most of the proposed changes in the MUTCD would provide additional guidance, clarification, and optional applications for traffic control devices. FHWA believes that the uniform application of traffic control devices supports efficiency of traffic operations 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. In addition, these changes would 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. Therefore, a full regulatory impact analysis is not required. An assessment of the potential economic impacts is available on the docket. FHWA requests public comment on all aspects of this analysis including data sources, methodology, and assumptions.

FHWA has considered the provisions of this NPA in relation to the regulatory policies found in 49 CFR 5.5 and has determined that the proposals contained herein are consistent with the policies governing the development and issuance of regulations. These include policies that there should be no more regulations than necessary, regulations should specify performance objectives, and, where they impose burdens, regulations should be narrowly tailored to address identified market failures or specific statutory mandates. Where this NPA proposes regulatory requirements prescribing specific conduct that regulated entities must adopt, FHWA has determined that these regulations are necessary to address the compelling need for nationwide uniformity to ensure the safety and efficiency of the traveling public.

Finally, this proposed rule is not an E.O. 13771 regulatory action because it is not significant under E.O. 12866. The proposed rulemaking introduces a variety of revisions resulting in clarification of language and organization of the MUTCD, deregulation through increased flexibility and alternatives for agencies, deregulation through relaxation of standards to guidance where appropriate, and the introduction of new traffic devices. For the purposes of this analysis, where revisions increase 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.

This NPA provides quantitative estimates of the expected compliance costs associated with the proposed substantive revisions. There are 132 substantive revisions in total. There are 124 substantive revisions with minimal or no impact, including the introduction of 37 new traffic control device applications. These revisions materially change the MUTCD requirements but have no cost impacts or minimal cost impacts.

The remaining eight substantive revisions have quantifiable economic impacts:

- Weight Limit signs (proposed Section 2B.66);
- Normal longitudinal line widths (proposed Section 3A.04);
- Wide longitudinal line widths (proposed Section 3A.04);
- Stop and yield lines (proposed Section 3B.19);
- Markings for diamond interchange with transposed-alignment crossroad (proposed Section 3B.31);

- Markings for part-time travel on a shoulder (proposed Section 3E.04);
- Accessible pedestrian signals and audible information devices (proposed Sections 4K.01, 4J.02, 4L.02, 4S.03, and 4U.02); and
- Stop and Yield signs on bicycle facilities (proposed Section 9B.01).

For the three substantive revisions for which costs can be quantified, the total 10-year estimated cost measured in 2018 dollars is \$541,978 when discounted to 2018 at 7 percent and \$589,667 when discounted at 3 percent. These costs are estimated as the sum of 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 proposed 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 proposed revision includes a compliance date. For those proposed changes without a compliance date, the analysis assumes that agencies would make traffic control devices comply with the proposed revisions at the end of the service life of a device. For those proposed changes with a compliance date, the analysis assumes that agencies would upgrade non-conforming traffic control devices through systematic upgrading, proportionally each year until the compliance date. The analysis period is 10 years starting with an implementation date of 2021 and extending through 2030.

The costs of five 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 and any mobility impacts from efficient operation. Currently, no specific data or studies exist to measure operational benefits or efficiency gains, and these benefits are evaluated qualitatively. Ideally, safety benefits would be measured by the revision's impact on crashes, but there are no data that correlate the direct impact of traffic

control devices with crash rates, and the safety benefits of these revisions could not be quantified. Potential safety benefits are evaluated qualitatively as well.

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

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 this action on small entities. Based on the evaluation, FHWA anticipates that this action would not have a significant economic impact on a substantial number of small entities. This proposed rule would add some new traffic control devices and only a limited number of new or changed requirements associated with existing topic areas, as well as new topic areas that were not previously addressed. Most of the proposed changes are expanded guidance and clarification information. Therefore, FHWA certifies that the action will not have a significant economic impact on a substantial number of small entities.

Unfunded Mandates Reform Act of 1995

FHWA has determined that this NPA will not impose unfunded mandates as defined by the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4, March 22, 1995, 109 Stat. 48). The proposed revisions can be phased in by the States over specified time periods in order to minimize hardship. Unless a compliance date is specified, the proposed changes to traffic control devices that would require an expenditure of funds allow for normal maintenance funds to replace the devices at the end of the material lifecycle. To the extent the proposed revisions would require expenditures by State and local governments on Federal-aid projects, they are reimbursable. This regulatory action will not result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of \$155,000,000 or more in any one year (2 U.S.C. 1532). In addition, the definition of "Federal mandate" in the Unfunded Mandates Reform Act excludes financial assistance of the type in which State, local, or Tribal governments have authority to adjust their participation in the program in accordance with changes made in the program by the Federal

Government. The Federal-aid highway program permits this type of flexibility. FHWA will publish a final analysis, including its response to public comments, when it publishes a final rule.

Executive Order 13132 (Federalism Assessment)

FHWA has analyzed this action in accordance with the principles and criteria contained in E.O. 13132. FHWA has determined that this action will not have sufficient federalism implications to warrant the preparation of a federalism assessment. FHWA has also determined that this action will not preempt any State law or State regulation or affect the States' ability to discharge traditional State governmental functions. The MUTCD is incorporated by reference in 23 CFR part 655, subpart F. These proposed amendments are in keeping with the Secretary of Transportation's authority under 23 U.S.C. 109(d), 315, and 402(a) to promulgate uniform guidelines to promote the safe and efficient utilization of the highways. The overriding safety benefits of the uniformity prescribed by the MUTCD are shared by all of the State and local governments, and changes made to this rule are directed at enhancing safety. To the extent that these proposed amendments override any existing State requirements regarding traffic control devices, they do so in the interest of national uniformity.

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 (OMB) for each collection of information they conduct, sponsor, or require through regulations. FHWA has determined that this action does not contain collection information requirements for purposes of the PRA.

National Environmental Policy Act

FHWA has analyzed this proposed rule for the purposes of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321, *et seq.*) and has determined that this action would not have any

effect on the quality of the human and natural environment because it only would make technical changes and incorporate by reference the latest versions of design standards and standard specifications previously adopted and incorporated by reference under 23 CFR part 625 and would remove the corresponding outdated or superseded versions of these standards and specifications. The proposed rule qualifies as a categorical exclusion to NEPA under 23 CFR 771.117(c)(20).

Executive Order 13175 (Tribal Consultation)

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

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, Traffic regulations.

Issued in Washington, DC, under authority delegated in 49 CFR part 1.85(a)(1).

Nicole R. Nason,

Administrator, Federal Highway Administration.

In consideration of the foregoing, FHWA proposes to amend 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.

■ 2. Amend appendix C to subpart A of part 470 by revising the Policy paragraph and Conditions paragraph 5 and removing the Sign Details heading and accompanying paragraphs 1 through 4 to 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

* * * * *

■ 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.

* * * * *

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).

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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:

a. In the introductory text to paragraph (d), by removing the text “below” and “call (202) 741–6030” and adding in their places “paragraphs (d)(1) and (2) of this section” and “email *fedreg.legal@nara.gov*”, respectively; and

b. 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, dated [date to be determined].

* * * * *

■ 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 Manual 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 in this paragraph (b)(1) 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 in this paragraph (b)(1) 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 in this paragraph (b)(1), for the express purpose of amending such laws over time.

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