

Comments on Docket No. FHWA-2020-0001 National Standards for Traffic Control Devices; the *Manual on Uniform Traffic Control Devices for Streets and Highways*; Revision

Please use this form to provide comments on the Notice of Proposed Amendments for the MUTCD.

INSTRUCTIONS:

1. Add your name or organization name where indicated in the footer of this form.
2. Use Table 1 to provide your original comments.
3. Use Table 2 to indicate your agreement with a comment that another commenter has submitted to the docket.
4. Do not adjust formatting of the rows and columns; text will automatically wrap and expand the row height as you type.
5. To add rows to this form, use the "Insert Rows" function, or hover just outside the left edge of the row below which you would like to add a row and click the encircled "+" that appears.
6. If you choose to provide a letter to accompany this comment form, please **print the document as a PDF; please do not scan a hard copy**. This will assist FHWA with cataloging your comments.

TABLE 1. ORIGINAL COMMENTS ON PROPOSED CHANGES. Please indicate the applicable proposed Section numbers in the far-left column. In the next three columns, please indicate your agreement, disagreement, or whether the column is applicable to your response by placing a, "YES," "NO," or "N/A" in the appropriate column of the row. If you agree with a proposed change, then there is no need to fill out the additional columns beyond the first two. However, it can be helpful to explain why you agree with a proposed change based on your objective experience as a roadway operator and/or empirical data. If you disagree in part or in whole, then please provide additional information that FHWA may find helpful.

Proposed Section Number(s)	Agree with concept and text as proposed	Agree with concept; suggested rewording of text in Comments	Disagree with concept	Comments <i>Please include justification for your position based on objective experience and empirical data. If there is a specific statement with which you take exception, please provide the Page and Line numbers from the mark-up version of the proposed MUTCD text.</i>
General	N/A	N/A	N/A	<p>Thank you for the opportunity to provide comments on the draft NPA. Although I am a member of the GMI Technical Committee of the National Committee on Uniform Traffic Control Devices (NCUTCD), these comments reflect my own opinions and do not necessarily reflect the views of GMI, NCUTCD, my employer, or any other entity.</p> <p>For brevity, my comments include only a subset of sections in the proposed NPA. It should be assumed that I am in support of (the majority of) NPA content not specifically called out.</p>
General	N/A	N/A	N/A	<p>I understand that several stakeholders, including some organizations I am a member of, have requested that the NPA be withdrawn and reissued later to provide greater attention in the MUTCD to the needs of pedestrians and bicyclists. However, I support proceeding with a final rule based on the existing NPA. The NPA includes a wide array of new traffic control devices and applications that will give agencies flexibility they have never had before. It would be preferable to provide this flexibility as quickly as possible, rather than waiting many months or years for a new version of an NPA to work its way through the formal approval process. For instance, I am not aware of any stakeholders who object to new optional provisions for freeway signing in Chapter 2E. It seems disingenuous to withhold valid and strongly supported parts of the MUTCD while other portions are being refined.</p> <p>Ironically, many of the new devices in the NPA do provide improved accommodations for people who walk and bicycle. It seems that relying on the 2009 MUTCD for longer than necessary would be a disservice to bicyclists and pedestrians by postponing the ability to take advantage of these elements of the NPA.</p>

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				<p>With that said, I also support broader revisions to the MUTCD to improve accommodations for bicyclists and pedestrians. I encourage FHWA to use its authority to issue official interpretations, Interim Approvals, and other measures after the publication of MUTCD v11 to further improve active transportation comfort and safety.</p>
1A.02	NO	NO	YES	<p>P. 2, lines 19-21, specifically identifies AMBER alerts as not being traffic control devices. P. 2, lines 5-6, indicates that they are “not considered to be traffic control devices and provisions for their design and use are not included in this Manual.” However, contrary to the text in this section, there are considerable provisions in the NPA that apply to the display of AMBER alerts (for instance, Sec. 2L.02, p. 317, lines 51-53). If AMBER alerts are included in the list in Sec. 1A.02, then they should not be further discussed in the MUTCD.</p> <p>P. 2, line 21, even includes a reference to Chapter 2L, after line 6 indicates that provisions on design and use are “not included in this Manual.”</p> <p>It does not appear that AMBER alerts belong in the same list as items A through E because of the MUTCD’s intent to provide additional provisions on their use.</p>
1A.03	NO	YES	N/A	<p>I strongly support the inclusion of Target Road Users in the MUTCD, which should be of considerable value when agencies defend tort liability claims. I offer a minor editorial comment on p. 2, lines 45-46. For parallelism, the text should say, “Pedestrians with disabilities might be blind or vision-impaired, have mobility limitations, or <u>have</u> other impairments.”</p>
1B.01	NO	YES	N/A	<p>On p. 7, line 30, the term “roadways” should be revised to read “roadways or shoulders”.</p>
1C.02	NO	YES	N/A	<p>On p. 21, line 36, the term “side roadway” is used, but this term is not defined, and it is not clear from context what it is intended to mean. Furthermore, it does not appear that “side roadway” is used anywhere else in the MUTCD or NPA. If “side roadway” is intended to be a subset of “roadway”, then definition 106(b) appears to conflict with definition 106(a), which indicates that intersections exist at the junction of two roadways. If “side roadway” is not intended to be a subset of “roadway”, then a different term should be used to avoid this perception.</p>
1C.02	NO	YES	N/A	<p>The definition of “pedestrian clearance time” is proposed to be revised on p. 24, lines 42-44 to allow the time to start when the pedestrian leaves “the curb or edge of the traveled way.” On roads with shoulders, including shoulders open to part-time motor vehicle travel, the edge of the traveled way is not the point where pedestrians will wait for a WALK indication. Pedestrian clearance time needs to be sufficient to allow pedestrians to cross from a safe refuge area.</p> <p>It might be argued that pedestrians’ waiting point is not relevant to pedestrian clearance time, because pedestrians leave their waiting point on the WALK indication, not at the start of the clearance time. However, a pedestrian who leaves the safe refuge area just at the start of the clearance time expects to be able to proceed entirely across the street at the design walking speed. Pedestrians do not expect to make a “point of no return” decision as they cross the edge of the traveled way.</p>

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				There is an additional problem with the proposed definition, because of the word “or”. On streets with both curbs and shoulders, how does an MUTCD user know whether the pedestrian clearance time starts when pedestrians leave the curb, or when they enter the traveled way? This additional problem could be rectified by the addition of text such as “whichever is farther from the center of the roadway.”
1C.02	NO	YES	N/A	<p>I invite FHWA to consider revising the definition of “roadway” on p. 27, lines 19-24. As written in the 2009 MUTCD and unmodified in the NPA, the word “roadway” expressly excludes shoulders but includes parking lanes. This definition creates problems in the context of part-time motor vehicle travel on shoulders, proposed in the NPA to be officially recognized for the first time. Under the current definition of “roadway”, motor vehicles traveling on a part-time shoulder are outside the roadway, which is not logical and causes several conflicts with other language in the MUTCD. After considering several possible options, I suggest that the definition of “roadway” should include paved shoulders. This would help address conflicts such as the following:</p> <ul style="list-style-type: none"> • In Sec. 1B.01, p. 7, line 18, the MUTCD purports to apply to “any street, roadway, or bikeway open to public travel,” which apparently means that it does not apply to shoulders even when shoulders are open to part-time motor vehicle travel, since shoulders are not part of the roadway. • In Sec. 1C.02, p. 18, lines 17-23, the term “crosswalk” is defined as a “part of a roadway,” which apparently means that a crosswalk can never exist across a shoulder, even when the shoulder is open to part-time motor vehicle travel. • In Sec. 1C.02, p. 22, lines 17-18, “lane-use control signal” is defined to permit or prohibit the use of “specific lanes of a roadway,” which seems to expressly prohibit their use to control shoulders, even when shoulders are open to part-time motor vehicle travel, and even when such use is encouraged on part-time shoulders in Sec. 2G.24. • Sec. 2N.06, p. 332, line 37, mandates the MAINTAIN TOP SAFE SPEED sign to be “not less than 6 feet nor more than 10 feet from the roadway edge”, which means that on roadways with shoulders more than 6 feet wide, such as those open to part-time motor vehicle travel, agencies are required to install such sign in the shoulder, introducing a fixed-object hazard, rather than off the edge of the shoulder. • In Sec. 4A.03, p. 402, lines 48-49, pedestrians facing a circular green indication “are permitted to proceed across the roadway within any marked or unmarked associated crosswalk.” Apparently pedestrians are not permitted to proceed across a shoulder, since shoulders are not part of the roadway and it is impossible to have a crosswalk across a shoulder, as noted above. • In Sec. 4A.03, p. 403, line 47, pedestrians facing a circular red indication are admonished not to “enter the roadway,” but apparently they may enter the shoulder, even when the shoulder is open to part-time motor vehicle travel. • Sec. 6H.01, p. 550, line 31, recommends advance warning signs “where any part of the roadway is obstructed or closed,” but does not recommend any such signs when the shoulder is obstructed or closed, even when the shoulder is open to part-time motor vehicle travel.

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				<p>These are just a few of the dozens of conflicts related to the word “roadway” in the proposed NPA.</p> <p>The definition of “roadway” was problematic even before the addition of part-time shoulder use to the MUTCD, mainly because the definition includes parking lanes but excludes shoulders. On many urban and suburban streets, edge lines are provided, but the area outside the edge line cannot always be considered a “parking lane.” Under the current definition of “roadway,” it is apparently necessary to determine whether parking is permitted outside the edge line to deduce whether that area is considered to be part of the “roadway.”</p> <p>Consider the roadway in this link, which is a two-lane, one-way street with a bicycle lane and additional space marked between the bike lane and the curb. The two motor-vehicle lanes and the bike lane are part of the “roadway” according to the MUTCD definition. However, it is less clear whether the space between the bike lane and the curb is part of the “roadway.” This space appears to be a parking lane, although no vehicles are parked there in the image. If parking is permitted, the area is apparently included in the “roadway”, so the right edge of the roadway would be the face of the curb.</p> <p>Further along the street is a sign prohibiting parking. Starting at that point, since parking is prohibited, the space between the bike lane and the curb cannot be considered a “parking lane”, which means it must be a shoulder, and it is therefore not included in the “roadway.” Apparently the edge of the roadway changes from the face of curb to the right edge of the bike lane at the point where the parking prohibition becomes effective.</p> <p>It seems rather ridiculous for an MUTCD user to undertake such a detailed review to determine the boundaries of a roadway, which should be much more obvious. Furthermore, an agency could change the boundaries of a “roadway” merely by establishing or removing parking prohibitions, and it does not appear that this is what the MUTCD intends.</p> <p>While the MUTCD’s definition of “roadway” has been relatively consistent for many years, it is not consistent with the definition of the word in other publications. Notably, the AASHTO Green Book defines “roadway” as “the portion of a highway, including shoulders, for vehicular use.”¹ It is highly challenging for practitioners designing a roadway and its associated traffic control devices to be forced to contend with different definitions for “roadway” in two such fundamental publications, particularly for a word that is so common as to be used thousands of times in each of these publications.</p> <p>On p. 31, lines 25-26, the MUTCD also defines “traveled way” as “the portion of the roadway for the movement of vehicles, exclusive of the shoulders . . . and parking lanes.”</p> <p>Following are areas included in and excluded from the current MUTCD definitions of “roadway” and “traveled way”:</p> <ul style="list-style-type: none"> • Roadway: includes travel lanes, bike lanes, parking lanes; excludes shoulders, berms, sidewalks.
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¹ A Policy on Geometric Design of Highways and Streets, AASHTO, 2018 Edition, p. 4-1.

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				<ul style="list-style-type: none"> Traveled way: includes travel lanes, bike lanes; excludes parking lanes, shoulders, berms, sidewalks. <p>Does the MUTCD really need two definitions that differ only in whether they include or exclude parking lanes—a space that does not even exist on many roadways? It would be much easier for authors and readers of the manual if the term “roadway” included paved shoulders and the term “traveled way” were used to refer only to lanes of travel.</p> <p>In several places, the MUTCD uses the phrase “roadway or shoulder” to clarify that the text applies to the shoulder in addition to the roadway. (For instance, “overhead sign” is defined in Sec. 1C.02, p. 24, lines 15-20 to include a structure of which any part “is directly above the roadway or shoulder.”) This text is technically correct, but it is cumbersome and wordy to frequently repeat “roadway or shoulder”.</p> <p>In other places, the MUTCD fails to include “or shoulder” when it seems appropriate. (For instance, Sec. 4D.06, p. 427, lines 23-26 presents several requirements for signal faces “located over the roadway,” but a direct reading of the sentence suggests that these requirements do not apply when signal faces are located over shoulders.) The failure to include “or shoulder” in many of the places where needed suggests that the authors of these sections may not have been aware that the definition of “roadway” does not include shoulders. Considering that the MUTCD has hundreds of authors, including FHWA staff and members of the NCUTCD, it is certainly to be expected that some authors may not be aware of the MUTCD’s unusual and counterintuitive definition of “roadway.”</p> <p>Many subsequent comments in this document identify areas where the word “roadway” is used incorrectly. These comments may be disregarded if FHWA chooses to change the definition of “roadway” as suggested in this comment.</p> <p>It is also recognized that a change to the definition of a word so commonly used as “roadway” will require a thorough review of the text, figures, and tables in the manual to ensure that all the uses of the term are consistent with the new definition.</p>
1C.02	NO	YES	N/A	If FHWA chooses to retain the existing definition of “roadway” on p. 27, lines 20-22, I suggest adding “part-time motor vehicle use of shoulders” to the list of elements (preceded by “even though”) specifically excluded from “roadway”.
1C.02	NO	YES	N/A	The definition of “traveled way” on p. 31, lines 25-26, indicates that the traveled way includes “the portion of the roadway for the movement of vehicles” but excludes shoulders. This definition introduces a conflict when shoulders are used for part-time motor vehicle travel. In this case, the part-time shoulder is used for the movement of vehicles, suggesting that it is part of the traveled way, but it is also specifically included in the definition of “shoulder” (def. 212, p. 28, lines 18-21) which suggests that it is not part of the traveled way. The definition of “traveled way” needs to be modified to be very clear about whether it includes shoulders open to part-time motor vehicle use.
2A.05	NO	YES	N/A	On p. 45, line 48, “roadway” should read “roadway or shoulder.”
2A.08	NO	YES	YES	On p. 48, lines 12-13, new text has been proposed related to display of units in fractional miles rather than decimals. However,

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				<p>the wording of the proposed text could be misinterpreted to disallow units other than miles (notably, feet).</p> <p>Furthermore, I disagree with the mandate to use fractional miles on bicycle guide signs. Bicyclists frequently measure distances using decimal miles, and bicyclists' slower speeds means there is a need to provide greater resolution in travel distance than for motor vehicles. Many agencies already use decimal miles on bicycle guide signs, and I am not aware of any research that suggests this use causes any safety or operational problems.</p> <p>I suggest rewording as follows: "Except on bicycle guide signs (see Chapter 9D), where distances on signs are displayed in units of miles, distances shall be expressed in fractions of a mile rather than decimals."</p>
2A.12	NO	NO	YES	<p>On p. 51, lines 35-38, new guidance has been proposed to recommend that signs be located on the left side of roadways "where a sign indicates an action by a road user in the left lane." I disagree with this concept. Most signs "indicate an action by a road user in the left lane," such as speed limits, advance horizontal alignment warning signs, advance traffic control signs, advance intersection signs, etc. In urban situations, it is highly uncommon to double-indicate all such signs on both sides of a street, but this guidance statement suggests that this practice would now be recommended. This would considerably increase sign clutter, the need for fixed-object sign supports, and agencies' signing costs, with questionable benefits. Furthermore, on wide undivided arterials, such as those with 3 or more travel lanes in each direction, a sign on the left side of the roadway is so far outside a driver's cone of vision as to be not valuable in attracting a driver's attention. I urge the deletion of this paragraph. Deleting this paragraph would still allow signs to be double-indicated where appropriate without adding a new very broad recommendation.</p>
2A.14	NO	NO	YES	<p>On .p. 53, lines 8-10, the following new text has been proposed: "The minimum mounting heights prescribed in this Section or as provided otherwise in this Manual shall not supersede those necessary for crash performance of sign installations that are required to be crashworthy." The implications of this standard statement are broad. With this statement, the MUTCD is ceding its authority on minimum mounting height to other entities, and it is not clear which entities are expected to have ultimate authority.</p> <p>Perhaps it means that sign support manufacturers would be in control of mounting heights. If a manufacturer decides that it is too much bother to manufacture a sign support that meets the MUTCD mounting height, it could manufacture a sign support that only works with a much lower mounting height. The manufacturer may market its sign support to agencies as much less expensive than its competitors. Since the MUTCD would "not supersede" the sign manufacturer's mounting heights, this sign support would be permitted to violate the MUTCD's mounting height provisions.</p> <p>Perhaps it means that state and local agencies would be in control of mounting heights. If they choose to purchase sign support systems that do not comply with MUTCD mounting heights, this proposed standard allows them to mount signs at much lower heights without violating the MUTCD. This proposed ceding of authority is not consistent with appropriate visibility and conspicuity of signs.</p>

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				<p>It seems possible that this new standard is intended to say that minimum mounting heights may need to be greater than specified in the MUTCD if required by the crashworthiness requirements of a sign support system. If this is the case, then the standard statement should be revised to a support statement, because the MUTCD should not provide mandates related to sign support hardware. The support statement could read, "It might be necessary to use larger minimum mounting heights than those prescribed in this Manual to ensure appropriate crash performance of sign installations that are required to be crashworthy."</p>
2A.17	NO	NO	YES	<p>On p. 56, lines 6-8, new text has been proposed that appears to disallow the mounting of a solar panel above a sign with the following rationale: "so as not to detract from or obscure the face of the sign, either directly or by casting shadows onto the sign, and so as not to obscure the shape of the sign."</p> <p>For solar-powered signs, it is very common for agencies to install a solar panel at the top of the sign installation, above the sign. I am not aware of any research that indicates that this positioning causes any problems with visibility or conspicuity, so it is troubling and puzzling that the NPA would appear to disallow this treatment.</p> <p>The very nature of solar installations requires that the solar panel be positioned to avoid shadows that fall on it. If a solar panel were positioned behind a sign, the sign is likely to cast a shadow on the panel for part or all of the day, and this could require the solar panel to be larger (and thus make the entire installation heavier and less crashworthy) or it could make solar power infeasible, which would significantly increase agencies' cost to provide a conventional power source and pay the power bills.</p> <p>I am aware of no other mandates in the MUTCD that prohibit shadows from being cast on a sign. Signs are permitted to be mounted on existing utility poles and other existing structures. These existing structures clearly support something else—power lines, luminaries, bridges, or other infrastructure—or they wouldn't be there at all. At certain times of day or year, it is very likely that some of this infrastructure casts a shadow on the face of the sign. Signs are also frequently located in dense urban areas with buildings and other structures nearby that inevitably cast shadows on signs. Signs in all areas may be positioned near trees and other vegetation that cast shadows. Signs must be designed to be conspicuous and visible even when shadows are cast upon them. It is not clear why solar panels are proposed to be, apparently, the only case in which shadows are prohibited by a standard statement.</p> <p>It is not necessary to include the rationale that a solar panel may not "obscure the face of the sign" or "obscure the shape of the sign" because both of these requirements apply broadly to all signs and are not specifically limited to sign installations with solar panels. Sec. 2A.12, p. 51, line 34, already recommends that signs be positioned so they "are not hidden from view". The text in Sec. 1D.06 covers uniformity in shape. If additional MUTCD text is necessary related to either of these, it should not be limited to signs co-mounted with solar panels.</p> <p>Since this proposed standard is particularly onerous to agencies by discouraging and complicating solar installations, I could only be</p>

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				convinced to support it if there were significant research indicating that safety problems result from the conventional mounting arrangement. I know of no such research, and as such, I strongly ask that the standard in lines 6-8 be eliminated. (I do not object to the first sentence of this standard, on lines 4-6.)
2A.19	NO	NO	YES	<p>On p. 56, lines 33-38, is a discussion of signs labeled “vanity” signs. This paragraph is inappropriate for the MUTCD and should be deleted. This paragraph does not clearly define what types of signs are considered “vanity” signs, but it does say that “vanity signs often take the form of General Information signs”. The word “often” implies that vanity signs also take the form of other sign types that are not identified.</p> <p>This paragraph undermines much of the text later in Part 2 about general information signs. Assuming that general information signs are the main type of vanity sign, this paragraph implies that general Information signs “provide no navigational guidance or orientation”. This assertion directly contradicts the first sentence in Chapter 2H, which says, “General Information signs provide road users with navigational or orientation, geographic, or other information useful for traffic operational purposes.” It is inappropriate for the MUTCD to assert that any broad category of signs is, essentially, of no value. Reading only this paragraph leaves a reader to wonder why general information signs are permitted at all.</p> <p>It is true that not all signs are relevant to every road user. Guide signs for intermediate exits along a traveler’s route are of no use to a traveler who is not planning to exit. Bicycle route markers are not relevant to the vast majority of motor vehicle traffic. The fact that some signs do not apply to “the majority or significant number of road users” should not relegate them to the status of unwanted.</p> <p>Even the word “vanity” itself is highly inappropriate, because it implies a bias against a wide category of signs. The word “vanity” could mean “excessive pride in a person’s own appearance” or “worthless”. Both of these definitions have a highly negative connotation, but neither definition appears to apply exactly to the signs at issue. As such, the exact meaning and intention of this paragraph are unclear. The main thing communicated by the paragraph is FHWA’s thinly-disguised contempt for a certain sign type, even when that same sign type is characterized as “useful” later in the same part of the MUTCD. I urge that the word “vanity” and this paragraph be stricken from the MUTCD. The main point of Sec. 2A.19 is eminently clear even without this paragraph.</p>
N/A	N/A	N/A	N/A	<p>Several sections in the MUTCD provide very prescriptive and sometimes inappropriate language related to certain types of signs, such as “vanity signs” (Sec. 2A.19), alternative fuels corridor signs (Sec. 2H.14), and others.</p> <p>I suggest creating a new section in Chapter 2A called “Low-Priority Signs”. This section could have text such as the following: “Low-priority signs should be limited to locations where they do not obscure or interfere with road users’ visibility or comprehension of higher-priority signs.” Additional text could be provided to be more specific, but the text should be in the form of guidance or support, not standards.</p> <p>When a subsequent section of Part 2 discusses a sign considered low-priority, a guidance statement could say, “These signs are</p>

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				<p>considered low-priority and should be installed in accordance with the provisions of Sec. 2A.XX.”</p> <p>This treatment avoids use of the biased term “vanity”, as discussed in an earlier comment, and instead uses “low-priority”, which has a much more neutral connotation. In addition, if specific provisions are included in this section, the provisions would apply to all signs considered “low-priority” without the need to repeat the provisions in every section in which a sign considered low-priority is discussed. This treatment would simplify the MUTCD for practitioners because it would avoid the need to interpret prescriptive provisions in several different sections that may or may not be identical. Also, by identifying low-priority signs in the sections in which they are discussed, this treatment avoids the uncertainty of which signs are considered “vanity” signs.</p>
2B.06	NO	YES	N/A	P. 66, lines 36-37, refers to a “shared-use path/roadway intersection.” The definition of “intersection” in Sec. 1C.02 does not include a place where a shared-use path crosses a roadway. It would be more appropriate to replace “intersection” with “crossing.”
2B.10	NO	YES	N/A	On p. 69, line 14, the word “intersection” should be “intersecting.”
2B.13	NO	YES	N/A	On p. 70, lines 49-50, criterion C appears to relate to sight distance, so it would be better suited in Sec. 2B.14 instead of 2B.13.
2B.19	NO	YES	N/A	The word “only” is proposed to be added on p. 73, line 9. The addition of this word causes the paragraph to conflict with the paragraph on the same page, lines 31-33. I suggest removing the word “only” on line 9 to allow agencies the flexibility that appears to be FHWA’s intent from the paragraph in lines 31-33.
2B.21	NO	YES	N/A	On p. 76, lines 34-35, the existing text is clumsy and could be replaced with, “. . . other resources are available to assist practitioners . . .”
2B.26	YES	N/A	N/A	I strongly support the use of a black background for bike lane lane-use signs as shown in Fig. 2B-4 (sheet 1), signs R3-8xa, R3-8xb, and R3-8xc. The black background, at a quick glance, clearly differentiates the bike lane from other lanes, which is helpful for road users of all modes.
2B.40	NO	YES	N/A	<p>On p. 91, lines 46-48, a new standard is proposed to be added related to the positioning of KEEP RIGHT signs. This standard uses text very similar to a guidance statement on the same page, lines 15-18. It appears that FHWA intended to upgrade the guidance statement to a standard. If so, the guidance statement should be deleted in deference to the new standard. However, I prefer that the MUTCD retain the existing guidance for this provision. There are many situations in which a KEEP RIGHT sign cannot be installed, or cannot be maintained, on the nose of a median and where such installation has been determined unnecessary. Examples include the following:</p> <ul style="list-style-type: none"> • Medians installed on low-speed local streets as part of traffic calming plans, for which object markers or other treatments on the median noses are more in keeping with the neighborhood context. • Islands installed at intersections to prevent one or more turning movements. In some cases, a KEEP RIGHT sign can contribute to sign clutter and diminish the effectiveness of more critical turn prohibition signs. • Medians that are narrower than current standards and on which KEEP RIGHT signs are frequently hit. <p>It is more appropriate that this provision be retained in the MUTCD as guidance rather than a standard.</p>

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2B.46	NO	YES	N/A	On p. 95, line 5, the word “roadways” should be replaced with “roadways and their adjacent shoulders.”
2C.45	NO	YES	N/A	Fig. 2C-13 (sheet 1) shows a dimension labeled 300 ft. max between the W4-2R sign and the start of the lane reduction taper. However, this dimension is not included in the text of Chapter 2C. I suggest ensuring that the dimension in the figure is supported with text so users can understand whether the 300-foot distance is intended as guidance, standard, or option.
2D.05	NO	YES	N/A	<p>The paragraph that starts on p. 159, line 1, needs an exception because it is qualified by the paragraph that starts on the same page, line 5.</p> <p>On line 5, the word “guides” should be singular.</p> <p>It is curious that the paragraph that starts on line 1 expressly addresses numerals, but the paragraph that starts on line 5 does not. I do not think this is intentional, because numerals that are part of a street name (for instance, numbered streets) invariably are the same height as upper-case letters associated with the same street name.</p>
2D.05 and other sections	NO	YES	N/A	I support the recommendations of the NCUTCD to refer only to the height of the initial upper-case letter of a mixed-case legend. The practice of referring to both the upper-case and lower-case letter height is distracting and wordy, and it is wholly unnecessary, because exact letter forms are prescribed in SHS. Furthermore, Clearview is proposed as an alternative lettering style, and the height relationship between upper-case and lower-case lettering is different for Clearview than other alphabets. The repeated mention of both upper-case and lower-case letter heights has also led to sign design errors related to sign design software.
2D.05	NO	YES	N/A	There is a disconnect between the letter heights shown on p. 159, lines 1-7, and the letter heights shown in Table 2D-2 (sheet 2), Part B, Destination and Other Guide Signs. The table calls for the names of destinations on overhead signs to have a leading upper-case letter height of 6” for speeds < 35 mph, 8” for speeds between 35-55 mph, and 13.33” (min.)/16” (des.) for speeds > 55 mph. However, p. 159 indicates different text heights than these with a different speed break point (40 mph). The same problem applies to numerals.
2D.31	NO	YES	N/A	The text proposed to be added on p. 170, line 19, causes a word to be missing from the sentence. Perhaps “are”.
2D.37	NO	NO	YES	<p>On p. 175, lines 16-17, the NPA proposes: “Arrow heights greater than 36 inches should be use[d] on high-speed approaches to provide adequate time for road user[s] to enter the proper lane for their destination.” This text is a little odd. How does an arrow height greater than 36 inches provide additional time? Furthermore, there is no indication of what speed constitutes “high” speed, and no consideration for features such as the number of lanes on the roadway, number of lanes a motorist might need to change, or the distance from the sign to the point of the turn. Why is only the arrow height subject to change on high speed approaches, but not the size of the text, route shields, or other features of the sign? How much higher than 36” should the arrows be on high-speed roads?</p> <p>Other research has shown that OAPL arrows are generally higher than necessary, and I concur with the NCUTCD recommendation to reduce arrow heights in Chapter 2E. I suggest deleting this guidance statement because it is vague, seems unnecessary, and 36” is very likely adequate height for all conventional roads. Even</p>

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				without the guidance statement, agencies may use taller arrows in unusual situations because the standard on line 14 says “minimum”.
2D.51	NO	YES	N/A	On p. 186, line 8, the sentence structure would support better parallelism by being reworded “ . . . is similar to signing Rest Areas.” This comment also applies to Sec. 2E.53, p. 235, line 37.
2D.55	NO	NO	YES	I do not support the guidance in the paragraph that starts on p. 189, line 39. It is very prescriptive and micromanages users of the manual to a much greater degree than normal. It is not reasonable for an agency to “evaluate the serviceability and general conformance” of hundreds or thousands of signs in a community just because some wayfinding signs are proposed. This wording also implies that signs should be replaced if found to be not in conformance, even though other provisions of the MUTCD allow such signs to remain in place for the rest of their service life. This could impose a significant cost on agencies. I do not understand what purpose this guidance serves, other than to discourage the use of wayfinding signs, which perhaps are viewed by FHWA as undesirable. There are plenty of other provisions in the MUTCD to ensure that signs are “serviceable” and comply with the MUTCD at the time they are upgraded at the end of their service life. It is not necessary or appropriate to recommend such an evaluation prior to the use of wayfinding signs.
2D.58	NO	YES	N/A	Text proposed on p. 194, lines 18-20 reads as follows: “A highway designated as a trail, auto tour route, or byway is not considered to be a named highway for the purposes of highway signing or road user navigation and orientation.” This is not quite correct as written. It suggests that no highway with such a designation could ever be considered “named”, which is incorrect. Streets with names are very commonly designated as “trails”, “byways”, etc. More accurate text would be, “A highway designation as a trail, auto tour route, or byway is not considered to be a highway name for the purposes of . . .”
2D.58	NO	NO	YES	On p. 194, lines 44-45, I disagree with the text proposed to be added. It is unclear what, exactly, this standard is intending to prohibit, because “standard highway sign legend elements” is very broad. For example, a street name is certainly a “standard sign legend element,” which suggests that it should be prohibited from such signs. However, signs with street names are shown in Fig. 2D-35, which would seem to violate this standard. More generally, “sign legend elements” include numbers, letters, and arrows, all of which are highly appropriate on the signs discussed in this section.
2E.01	NO	YES	N/A	Letter heights are mentioned on p. 199, lines 35-36, but the text does not clarify that they refer to the initial upper-case letter of a mixed-case legend. On p. 199, line 39, the word “unusually” should be deleted. It is vague and unnecessary.
2E.15	NO	NO	YES	Existing MUTCD guidance that is not proposed to change on p. 206, line 42, says, “A city name and a street name on the same sign should be avoided.” I am not aware of any research that indicates the presence of both a street name and a city name on the same sign causes undue confusion. In some cases, where it is determined that both the city name and the street name are important information for motorists, this guidance statement has resulted in relocation of either the city name or the street name to a supplemental guide sign, which requires an entirely separate sign installation that adds cost to agencies, introduces another fixed object hazard on the roadside, and contributes to sign clutter.

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				<p>Several figures in the MUTCD and NPA violate this guidance statement, including the following:</p> <ul style="list-style-type: none"> • Fig. 2A-2 • Fig. 2E-20 • Fig. 2E-47 • Fig. 2E-49 • Fig. 2E-58 • Fig. 2E-60 <p>The use of a street name and a city name on the same sign panel is analogous to a route number and a control city on the same panel, which is expressly encouraged by the MUTCD. It is not clear why this latter configuration is encouraged but the former is not recommended.</p> <p>Rather than modify the figures noted above, perhaps it is time to eliminate this guidance statement in Sec. 2E.15.</p>
2E.18	NO	NO	YES	<p>I disagree with the proposed change on p. 207, lines 1-2, that would require arrows on post-mounted exit direction signs be positioned at the bottom center of the sign panel. This change is contrary to current practice at many agencies, and it is not necessary to apply this proposed standard so broadly. It is true that in some cases, due to visibility constraints, the arrow may be more visible when centered at the bottom of the sign panel, but these cases are rare. When this is true, agencies certainly should have the option to use an arrow at the bottom of the sign panel. However, in the vast majority of cases, there is no visibility constraint, and in these cases there is considerable value in using the same exit direction sign format both for overhead and post-mounted use. I concur with the NCUTCD recommendation on this issue.</p> <p>If this standard is retained in the MUTCD contrary to the NCUTCD recommendation, then Fig. 2E-12 needs to be modified to show examples of signs with the arrow centered at the bottom of the panel and distinguish the formats for overhead and post-mounted use.</p>
2E.22	NO	YES	N/A	<p>For parallelism, on p. 209, line 28, the text proposed to be added should start with "assists road users in reporting their location . . ."</p>
2E.22	NO	YES	N/A	<p>I agree with the NCUTCD recommendation that Sec. 2E.22 (and other parts of the MUTCD) should refer to "exit numbering" and not "interchange numbering." The purpose of the exercise is to number exits from the mainline, not number interchanges. The use of the term "interchange numbering" causes confusion when it comes to suffix letters, and particularly the recommended use of different suffix letters for the same interchange in opposite directions. This comment applies to (at least) the following:</p> <ul style="list-style-type: none"> • P. 210, line 3 • P. 210, line 14 • P. 210, line 19 • P. 210, line 40 • P. 211, line 21 • P. 211, line 22 • P. 211, line 26 • P. 211, line 32 • P. 211, line 33 • P. 211, line 35 • P. 211, line 37

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				<ul style="list-style-type: none"> • Fig. 2E-5 title and legend • Fig. 2E-6 title and legend • Fig. 2E-7 title and legend • Fig. 2E-8 title and legend • P. 214, line 7 • P. 216, line 28 • P. 216, lines 28-29 • P. 222, line 7 • P. 233, line 45 • P. 234, line 2 • P. 294, line 24 • P. 294, line 30 • P. 296, line 17 • P. 297, line 9 • P. 308, line 31 • P. 309, line 7 • P. 309, line 9
2E.23	NO	YES	N/A	<p>P. 212, lines 14-15, introduces a new recommendation about displaying units on freeway guide signs in units of feet. I concur with the NCUTCD that this concept is flawed. First, the guidance purports to apply to signs “where the distance to be displayed . . . is less than ¼ mile.” How can the distance to be displayed ever be less than ¼ mile, because the previous sentence recommends that distances be shown to the nearest ¼ mile? Furthermore, motorists have learned over many decades of consistent freeway signing practice that “¼ mile” is the shortest distance ever shown on such signs. Motorists know that when they see a distance of ¼ mile on an advance guide sign, they need to be prepared to exit immediately. This interpretation is accurate even if the actual distance to the exit is slightly less than ¼ mile. I submit that many, if not most, motorists do not know whether, for example, 1000 feet is greater than or less than ¼ mile, especially at freeway speeds in proximity to a freeway exit where particular attention is needed on lane positioning, lane changing, and other text on guide signs. Using any message other than “¼ mile” risks having motorists fail to understand the urgency of the approaching exit and introducing confusion related to a change in distance units. This change is contrary to the uniformity that has been established over decades in which distances on freeway signs are uniformly expressed to the nearest ¼ mile.</p> <p>This new provision also conflicts with the standard on the same page on line 18, which requires fractions of a mile to be displayed “in all cases.” This standard appears to disallow the use of feet or any other units.</p> <p>On line 13 of the same page, it does not appear that the qualifier “Where an Advance guide sign is located less than ½ mile from the exit” is needed, because the distance displayed should be to the nearest ¼ mile even when guide signs are more than ½ mile from the exit. If this qualifier is kept, then additional text should be added to indicate how the distance should be rounded for signs located ½ mile or greater from the exit.</p>
2E.23	NO	YES	YES	<p>The guidance on p. 213, lines 1-4 does not appear to involve the appropriate boundary definitions for the 800-foot dimension that has been in the MUTCD previously. I concur with the NCUTCD on recommended changes to this paragraph. This comment also applies to Sec. 2E.24, p. 213, lines 24-26.</p>

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2E.25	NO	YES	N/A	On p. 215, line 39, the word “roadway” should be changed to “ramp.”
2E.28	NO	NO	NO	In Fig. 2E-23, it does not appear that the text of the MUTCD permits the use of a white down arrow on the sign in the bottom center of the figure.
2E.32	NO	YES	N/A	The option statement on p. 221, lines 8-10, appears to be misplaced. It seems to apply to interchanges generally, not just diamond interchanges in urban areas, the subject of Sec. 2E.32.
2E.36	NO	NO	NO	P. 222, lines 31-35, provides guidance that signs approaching C-D roadways should comply with the provisions of Sec. 2E.15. However, Fig. 2E-32 (sheet 2) shows three destination names on a single guide sign, which violates the provisions of 2E.15. It would be interesting to see a revised version that complies with 2E.15, because the C-D roadway provides access to three interchanges but the guide sign should only list two. Practitioners would be interested to know how they should select which two of three should be shown on the main guide sign and which should be omitted or relegated to a supplemental sign.
2E.37	NO	YES	N/A	The last two standard statements on p. 223, lines 24-26, appear to be unnecessary and should be deleted.
2E.38	NO	NO	YES	<p>The term “split” is used in the text and title of this section and the title of Fig. 2E-34. However, the term “split” is not defined in the MUTCD, and it is unclear from context exactly what situations are intended to be applicable to Sec. 2E.38. A main question: How is a freeway split different than a “freeway-to-freeway interchange,” which is the subject of Sec. 2E.37? NCUTCD members debated this question at length during the NPA comment period but could not reach a consensus on FHWA’s intent for use of this word. Both Fig. 2E-34 and Fig. 2E-38 purport to show configurations labeled “split”, but both show different circumstances related to route numbering. They both have in common the alignment of the ramps downstream of the gore, but surely ramp alignment is not what differentiates a “split” from other types of interchanges. One wonders why Fig. 2E-33 (sheet 1) is not designated a “split”, because it contains most of the same characteristics as Fig. 2E-34.</p> <p>It is critical for practitioners to have a clear understanding of what situations constitute a “split”, because p. 223, line 45, issues a standard that splits are required to use the design shown in Fig. 2E-34. (In general, I do not support standards that require “sign designs” as shown in a figure. This leaves open to question which elements of the design are subject to change due to the unique circumstances associated with a particular interchange.)</p> <p>Since we have survived this long without a definition for “split”, I contend that the word may not be necessary at all. I suggest eradicating the word “split” from the MUTCD and combining Sec. 2E.38 with Sec. 2E.37. This would allow some redundancies to be eliminated. For instance, p. 224, lines 1-3 of Sec. 2E.38, provides the same information as p. 223, lines 24-26 of Sec. 2E.37, but uses different wording.</p>
2E.48	NO	YES	N/A	P. 232, lines 27-28, requires post-interchange travel time signs to comply with paragraph 1 of Sec. 2E.48. (Presumably this should refer to Sec. 2E.47.) However, Sec. 2E.47 requires the first line of the sign to identify the “next meaningful interchange”. It is not clear that the “next meaningful interchange” is the best information for a travel time sign, because this could be a very short distance away, such that travel time information to this point is not helpful. (The

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				<p>word “meaningful” is vague and undefined, and it should probably be replaced with something more specific.)</p> <p>Also, Sec. 2E.48 provides no information about how to select the second and third lines of a post-interchange travel time sign, and does not refer back to the provisions in Sec. 2E.47 for selecting these lines. If these provisions of Sec. 2E.47 are intended to apply to Sec. 2E.48, then the sign in Fig. 2E-53 does not comply, because it lists an interchange as the bottom line of the sign, but 2E.47 (p. 232, lines 10-11) requires the bottom line to be the control city.</p>
2E.50	NO	NO	YES	<p>On p. 233, line 34, I suggest deleting the text “two primary” because the text as written implies that advance guide and exit direction signs always list two destinations, which is not true.</p> <p>I oppose the text proposed to be added on p. 234, lines 11-13. Under the existing MUTCD, agencies are encouraged to limit supplemental guide signs to one per interchange approach and to limit supplemental destinations to two per sign. This results in a maximum of two supplemental destinations per interchange approach. The new text permits a maximum of 4 supplemental destinations per interchange, which will have the result of causing many more supplemental signs to be installed for destinations that are of limited value. Agencies will face extreme pressure to change their internal policies to permit four destinations per interchange, which contradicts the guidance on p. 233, lines 42-44. It is quite unorthodox for the manual to include a standard that so brazenly violates guidance in the same section.</p> <p>Also, it is contradictory that the MUTCD takes such a strong position against “vanity” signs in Sec. 2A.19 but goes on in Sec. 2E.50 to double the permissible number of supplemental guide sign destinations at each freeway interchange. Supplemental guide signs often epitomize the phrase “little value or interest to the majority or significant number of road users.”</p>
2E.50	NO	YES	N/A	<p>On p. 234, line 15, I suggest replacing the word “that” with “an”, because supplemental guide signs should not be located near guide signs for any interchange, not just guide signs related to the applicable interchange.</p>
2E.51, 2E-52	NO	NO	NO	<p>In Fig. 2E-58 and 2E-60, guide signs are shown with the legend “Third Ave.” I suggest revising to “3rd Ave” to avoid the perception that numbered streets need to be, or are preferred to be, spelled out. I don’t know that the MUTCD has any provisions on this issue, but in general, for numbered streets, using numerals on guide signs allows for quicker conspicuity and recognition rather than reading an ordinal number spelled out in a word. Using numerals also usually results in a shorter legend, which results in a smaller sign that is less expensive to install and maintain.</p>
2E.53	NO	YES	N/A	<p>I disagree with the NCUTCD recommendation to omit the exit gore sign at weigh stations when the exit directional sign is mounted overhead. I believe the exit gore sign is a critical element of freeway signing, and concur with FHWA’s text that requires a gore sign as a standard component of weigh station signing, for the following reasons:</p> <ul style="list-style-type: none"> It may be true that some gore areas at weigh stations are too narrow for a standard sign. However, the MUTCD offers flexibility for deviating from standards in situations like this when it is not possible to comply. Very rare cases should not control what standards are in place for more common cases. Maintaining a gore sign as a standard

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				<p>would likely encourage agencies to come up with innovative ways to sign narrow gores, such as using Series D lettering, smaller lettering, differences in format, etc. Any of these options is preferable to complete omission of the gore sign.</p> <ul style="list-style-type: none"> • The proposed NCUTCD text is very broad—it does not indicate that the option to omit the gore sign only applies, for instance, where the gore is too narrow, or where the gore sign is frequently hit. • The gore sign is a critical component of freeway signing. The MUTCD requires a gore sign at every other departure point from the mainline. Weigh stations should not be the sole exception from this requirement. • Among the benefits of gore signs is to help drivers distinguish the location of the gore during snowy conditions when the pavement markings (and edges of pavement) may not be visible. I contend this may be more important for weigh stations, which could have less traffic volume than other parts of the freeway network and hence may be more prone to snow accumulation. This benefit also extends to situations during heavy rain in the dark when the pavement markings are not providing optimal retroreflectivity. • It is a dangerous precedent to assert that if the Exit Direction sign is overhead, then a gore sign is not needed. If this claim is true for weigh stations, why isn't it also true for every other exit from a freeway? In urban areas almost every exit direction sign is overhead, but these are the very areas where gore signs are most needed. • Even at minor interchanges (Sec. 2E.30), where the MUTCD sanctions omitting some guide signs, "at least one Advance Guide sign and an Exit Gore sign shall be used." If gore signs are omitted at weigh stations, the resulting order of guide sign preference/priority would be different than is already in place for minor interchanges. Weigh stations do not justify a different order of priority. • NCUTCD's proposed option statement conflicts with a standard in Sec. 2E.26 (p. 216, lines 26-27), which says: "An Exit Gore sign shall be located in the gore for each ramp that departs from the main roadway of a freeway or expressway." • NCUTCD's proposed language seems to indicate that if a weigh station exit gore sign is omitted, then nothing needs to be installed in the gore to replace it. I do not agree with the concept of leaving the gore completely devoid of reflective devices. <p>Other than the omission of the gore sign, I agree with the other comments proffered by NCUTCD on Sec. 2E.53.</p>
2E.57	NO	NO	YES	<p>I disagree with the option proposed on p. 238, lines 37-40. It is not necessary or desirable to use exit numbers and very large guide signs at conventional intersections. The signs shown in Fig. 2E-65 are very large, much larger than necessary according to Chapter 2D, so large that they are likely to obscure traffic signal indications and cause a safety problem. It is particularly unnecessary to use exit number suffixes and LEFT EXIT panels for movements that are left and right turns at conventional intersections.</p> <p>The use of exit numbers and exit number panels should be limited to freeway and expressway exits, and not used at conventional intersections.</p>

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2G.03	NO	YES	N/A	On p. 258, line 24, “roadway” should be “roadway or shoulder.”
2G.20	NO	YES	N/A	<p>With regard to the proposed provisions for part-time motor vehicle shoulder use, the text and figures need to consider a condition where a full-time travel lane transitions to become a shoulder travel lane without the need for motorists to change lanes. (The reverse is also common, in which a shoulder lane transitions to become a full-time travel lane without the need for lane-changing.) In my experience, this condition is more common than those shown in Fig. 2G-32, which assume that motorists must merge out of a travel lane to use the shoulder and merge out of the shoulder where the shoulder-use ends. Many of the provisions recommended or required in Chapters 2G and 3E for part-time shoulder use are not necessary or are inaccurate for this condition, including the following:</p> <ul style="list-style-type: none"> • The regulatory signs required on p. 277, lines 18-22, are unnecessary and could inappropriately communicate to drivers using the shoulder that a lane change is required even when it is not. • Use of a red X “in advance of the location where part-time travel on the shoulder ends”, Sec. 2G.24, p. 278, lines 27-31 is incorrect where the shoulder travel lane continues as a general purpose lane with no need for motorists to merge. <p>The MUTCD should include a figure that shows the complete catalog of signs applicable to this situation, as is done frequently with other regulatory and warning signs. The references to sign numbers in the text makes signs difficult to find using only the typical application figures.</p> <p>Although Sec. 2G.20 purports to apply to situations where “certain classes of vehicles, such as buses” are permitted to use shoulders, many of the signs shown in Fig. 2G-32 are not appropriate for bus use of shoulders. These applications tend to be variable in hours of use, involve a speed threshold, permit discretion of the bus operator, and be limited in speed. It is desirable to avoid oversigning this condition because it can inappropriately encourage drivers of other classes of vehicles to use the shoulder in addition to buses. Drivers of buses on bus-shoulder corridors are very familiar with conditions, must obey strict operating procedures promulgated by the relevant transit authority, and do not need a large complement of regulatory or warning signs to be aware of regulations and conditions.</p> <p>The standard on p. 276, lines 44-45, indicates that a shoulder should be signed and marked as a travel lane when it “has been opened to travel on a permanent, full-time basis.” Many shoulders are open to bicycle travel on a permanent, full-time basis, and as such they appear to satisfy the condition in this standard. However, it does not appear to be FHWA’s intent that shoulders permanently open to bicycle travel shall be signed as travel lanes. A revision to the wording of this standard is needed to avoid this perception.</p> <p>Furthermore, the text and section titles that refer to “part-time travel on a shoulder” should be modified to acknowledge that they apply to motor vehicle travel on shoulders, not bicycle or pedestrian travel. This portion of the comment applies to the relevant sections in both Parts 2 and 3.</p>
2G.22	NO	YES	N/A	The W3-9 sign shown in Fig. 2G-32 (sheet 2) and discussed on p. 277, lines 36-41, is formatted with static days of week and times of

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				day on the face of the sign. It does not appear that an alternative version of this sign has been proposed for part-time shoulder use that is variable in its operational hours.
2G.24	NO	YES	N/A	<p>Lane use control signals are defined in Sec. 1C.02, p. 22, lines 17-18, as being applicable to “specific lanes of a roadway”. A shoulder is not part of the roadway, even when it is open to part-time motor vehicle travel. As such, it is impossible to use lane-use control signals to control a shoulder as advocated by Sec. 2G.24.</p> <p>On p. 278, lines 19-21, the red X indication is described as meaning “travel on the shoulder is otherwise prohibited.” This does not acknowledge that on arterial streets and even some freeways, bicyclists are permitted to use shoulders at all times. The use of a red X over a shoulder on which bicyclists are otherwise permitted to operate has safety and legal implications. It implies (to motorists, law enforcement, and others) that cyclists using the shoulder are doing so illegally, and may encourage cyclists to be cited for this use and to be deemed at fault in any related collisions. Worse, it may discourage cyclists from riding along the relative safety of the shoulder and encourage them to share a travel lane with motor vehicles or share a sidewalk with pedestrians, both of which are less desirable from a safety perspective.</p>
2H.07	NO	NO	YES	I disagree with the proposed standard on p. 283, lines 23-24, that State Welcome signs are limited to independent, post-mounted sign assemblies. In urban areas, it may be impossible to mount a large sign on the roadside due to constrained right-of-way, sound walls, etc. Also, in an area dense with interchanges, it may not be possible to obtain 800' clearance without co-mounting the state welcome sign with another sign. It seems more cost-effective to co-mount the state welcome sign rather than construct a separate overhead structure (if overhead mounting is needed).
2H.08	NO	YES	N/A	It is unusual that the sign with the name “Future Interstate Route” (I2-4) as shown on p. 283, line 40, has the legend “Future Interstate Corridor” as shown in Fig. 2H-2.
2H.09	NO	YES	N/A	<p>Sec. 2H.09 provides no information about the content of the Project Information sign, other than Fig. 2H-3. Readers of the MUTCD may assume that the sign shown in Fig. 2H-3 is the only possible format, that such signs must contain all the information shown on the sign in Fig. 2H-3, and may not contain any information other than on the sign in Fig. 2H-3. I suggest adding text to Sec. 2H.09 to indicate that the contents of the sign may vary.</p> <p>It is not clear how a reader of the MUTCD would discern the correct lettering height and style for the Project Information sign. Table 2E-5 provides required lettering height for “boundary and orientation signs,” but the Project Information sign appears to neither denote a boundary nor provide road users with orientation. As such, it is not clear what letter height is required. The sign in Fig. 2H-3 appears to show several lettering heights and styles.</p>
2H.10	NO	YES	N/A	I suggest deleting the guidance sentence on p. 284, lines 29-30, which says, “Adequate separation from other overhead signs that are mounted to the structure should be provided.” This guidance statement implies that adequate separation is only needed with respect to other overhead signs on the same structure, when in fact, adequate separation is needed between every sign in the world and every other sign in the world. The word “adequate” is so vague as to be meaningless, and as a result, this sentence does not add any value for practitioners.

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				Also, in Fig. 2H-4, the sign shown on the bridge fascia is only partially above the shoulder and travel lane. This appears to conflict with the guidance on p. 284, line 29, which recommends that the sign be “above the travel lanes or shoulder”.
2H.14	NO	YES	N/A	<p>The word “sparingly” is used on p. 289, line 30, in a support statement that seems like it should have been written as a guidance statement.</p> <p>On the same page, lines 35-36, an option statement allows Alternative Fuels Corridor signs to “be located beyond major intersections or major interchanges.” In urban areas, major interchanges (as defined in Sec. 1C.02, p. 22, lines 39-41) may be located very frequently—perhaps every mile. Is use of the term “major interchanges” in Sec. 2H.14 intending to rely on this definition from Sec. 1C.02? If so, it does not feel “sparing” to install Alternative Fuel Corridor signs so frequently in an urban area already dense with other, more critical signs. I suggest rewording this option statement to encourage these signs to be spaced much farther apart, as apparently intended by the guidance statement masquerading as support in lines 29-30.</p> <p>However, the standard on p. 290, lines 37-44, is much too prescriptive. The word “around” should never be used in a shall statement because it is too vague, and users have no way to understand if they are in compliance with FHWA’s intent. Items A and B in this list appear to be unnecessary because the same intent is expressed more clearly with the distances on p. 290, lines 50-51, and p. 291, line 1. It is also incorrect to assert that Alternative Fuel Corridor signs shall not be located “around any other traffic control device,” considering that traffic control devices include pavement markings, delineators, and temporary traffic control devices. Every square inch of road in the world is part of a work zone at some point, and it is impossible to avoid using temporary traffic control devices merely because they happen to be “around” an alternative fuel corridor sign. It would also be very unorthodox to interrupt all pavement markings “around” such signs.</p> <p>The text in the standard statement on p. 290, lines 31-32, fully expresses the intent to consider these signs as secondary in priority. The remaining text (aside from item D, lines 45-47) is wholly unnecessary because it requires such extensive effort on the part of practitioners to comply with. Agencies are well equipped to understand how to deal with secondary-priority signs and do not need such detailed instructions every time such a lower-priority sign is mentioned in the MUTCD. Agencies would be open to legal liability if a well-meaning sign crew installs another sign “around” an Alternative Fuels corridor sign even if the two signs cause no particular problem by their proximity.</p> <p>Furthermore, the word “conflicts” on p. 291, line 3, is undefined and vague.</p> <p>See also my earlier comment about low-priority signs.</p>
2I.03	NO	YES	N/A	<p>The guidance statement on p. 294, line 24, is potentially ambiguous, because it could be interpreted to recommend general service signs at all numbered exits. It should be reworded to read, “Where General Service Signs are used in areas with exit numbering, the D9-18 or D9-18a should be used.”</p>

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				<p>Also, the option statement on p. 294, lines 30-32, appears to conflict with the new guidance statement proposed on line 24 of the same page.</p> <p>On p. 295, line 30, the text should say “exit number” instead of “number”.</p>
2J.09	NO	YES	N/A	P. 309, line 28, refers to guide signs, but the signs shown in the figure are actually specific service signs.
2L.02	NO	YES	N/A	I suggest deleting the sentence that begins on p. 316, line 52. The phrase “related to traffic control” is vague, undefined, and not helpful to practitioners. The entire sentence is redundant, because the previous sentence already disallows everything mentioned in this sentence. It also duplicates an existing standard in Sec. 1D.09, p. 40, lines 30-31.
2L.05	NO	YES	N/A	In Table 2L-4, Example 6, the legend “ROADWOR/K/NEXT” appears to be an error. If the intended text is “ROADWORK/NEXT/3 MILES”, I would be in support.
2L.07	NO	YES	N/A	<p>The text “that motorist experience frequent incidents that slows traffic” on p. 323, line 4, should be replaced with “that experience frequent incidents that slow traffic.”</p> <p>The sentence that starts on p. 323, line 14, is unnecessarily wordy. It should be replaced with “Distances displayed as part of travel time messages should be rounded to the nearest mile.”</p>
2M.10	NO	YES	N/A	The word “vanity” should not be used on p. 329, line 44. See my earlier related comments. The reference to Sec. 2A.03 appears to be incorrect because this section does not mention vanity signs. The section that does mention vanity signs, 2A.19, does not include “provisions for locating” them as promised in this guidance statement.
3A.03	NO	YES	N/A	<p>It appears the allowable colors for markings on p. 336, line 22, should be expanded to include green, because green is expressly permitted as a pavement color. There is no definition of “marking” in Part 1, so it is not perfectly clear if colored pavement is considered a “marking.” However, colored pavement is in Part 3, which suggests that it is considered a “marking.” Also, Sec. 3H.01, p. 389, line 31, refers to colored pavements “supplementing other markings.” The word “other” suggests that colored pavements are considered markings, because if colored pavements were not considered markings, this sentence would have referred to colored pavements “supplementing markings.”</p> <p>This text is also not consistent with the paragraph that starts on p. 337, line 6. Presumably many colors other than those listed here are permissible as a pavement marking that simulates a route shield if they are the same the color as the official route shield sign. There are probably too many “official route shield” signs to list all the possible colors, and it is not clear that a list of colors is particularly helpful in Sec. 3A.03 because the list is devoid of context of allowable uses.</p>
3A.04	NO	YES	N/A	<p>On p. 337, line 26, it is not clear that the word “extension” applies to both “lane line” and “edge line.” It would be clearer to say, “lane line extension or edge line extension.”</p> <p>On p. 337, line 30, the NPA uses the symbol “>”, but this symbol is not typically used in MUTCD text.</p>
3B.02	NO	YES	N/A	The sentence that begins on p. 339, line 42, should clarify that it applies only to undivided two-way roads. The subsequent sentence

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				should clarify that it applies only to undivided roads. Other provisions in this section also need to be limited accordingly.
3B.05	NO	NO	YES	<p>I disagree with the proposed guidance on p. 343, line 9, that “TWLTLs should not extend to intersections.” Experience has shown that TWLTLs work very well on urban arterials with frequently-spaced low volume intersections that sometimes stagger from one side of the street to the other. The distance between intersections on opposite sides of the street is often too short to allow one-way left-turn lanes of any acceptable length. TWLTLs are also often used on the mainline approach to a T-intersection where the fourth leg (opposite the stem of the T) is a low-volume driveway. This use helps communicate the minor nature of the driveway and helps prevent motorists from mistakenly entering the driveway thinking it is a more major street.</p> <p>The proposed guidance seems to imply that a one-way left-turn lane approaching an intersection is preferable to a TWLTL. This implication is incorrect. A major disadvantage of a one-way left-turn lane is that motorists traveling in the opposite direction of the one-way left-turn lane are not legally permitted to use the left-turn lane to turn left (into a closely-spaced intersection or driveway). It is highly undesirable to encourage or require left-turning motorists to stop in a through lane to wait for a gap in opposing traffic to make a left turn.</p> <p>The proposed guidance is even more onerous because of support text in Sec. 3B.11, p. 349, lines 21-22, which indicates that “driveway connections can be considered as intersections.”</p> <p>This proposed guidance is unnecessarily prescriptive and increases the complexity and expense of marking urban arterials. I am not aware of any research that suggest that TWLTLs cannot operate effectively approaching intersections, and as such, I strongly ask that this guidance statement be stricken.</p>
3B.06	NO	YES	N/A	<p>In Fig. 3B-10, the “normal width dotted white lane line” in the upper portion of the figure looks the same as the “wide” line in the lower part of the figure. The line style should be modified to show a discernable difference in the figure.</p> <p>P. 345, line 4, indicates that Fig. 3B-13 consists of two sheets, but only one sheet is shown.</p>
3B.09	NO	YES	N/A	P. 348, lines 5 and 15, includes references to paragraph 9 of Sec. 3E.04. At least two paragraphs in Sec. 3E.04 deal with edge lines, so it may be preferable to remove the paragraph numbers from Sec. 3B.09.
3B.11	NO	NO	YES	<p>P. 349, lines 21-22, indicates that “driveway connections can be considered as intersections” and claims this interpretation is “in accordance with Definition 101 in Section 1C.02.” (Presumably this should refer to Definition 106.)</p> <p>In fact, this text does not appear to be consistent at all with the definition of “intersection” in Sec. 1C.02 that begins on p. 21, line 31. The phrase “driveway connection” is not used in this definition and does not appear to be defined anywhere else in the MUTCD. It is not clear if “driveway connection” is intended to mean the same thing as “driveway.” If so, Sec. 1C.02 expressly excludes driveways from the definition of “intersection”.</p>

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				<p>Rather than using Sec. 3B.11 to change a definition already established as a standard in Sec. 1C.02, I suggest removing this support statement and merely noting that pavement marking extensions may also be applied across driveways.</p>
3B.22	NO	YES	N/A	<p>P. 361, lines 40-41, refers to “shared-use paths that are reserved exclusively for pedestrian use.” By definition in Sec. 1C.02, p. 28, line 13, a “shared-use path” is a “bikeway” that happens to also be used by pedestrians. It is impossible by definition to have a shared-use path open only to pedestrians. At the very least, I suggest omitting this example from the option statement.</p> <p>However, I think an argument could be made that the entire option statement should be deleted. I struggle to conjure an example of a situation where pedestrians are permitted to the exclusion of all other travel modes, considering that other modes might include a bicyclist, perhaps a toddler riding a bicycle alongside a walking parent, an autonomous drone delivery vehicle permitted by state law to operate on a sidewalk, or a person riding a so-called “hoverboard” that is not considered either “skates” or a “skateboard” per the definition of “pedestrian” in Sec. 1C.02, p. 24, line 39.</p> <p>If this option statement is retained, I suggest modifying the text “reserved exclusively for pedestrian use” to something such as, “where pedestrians are the primary intended users, and where alternative routes have been designated for bicyclists.”</p>
3B.25	NO	YES	N/A	<p>I disagree with NCUTCD’s proposed changes to Sec. 3B.25 (p. 363-364), which make minor modifications to the NPA text and convert many provisions from guidance to options. I also disagree with the NPA provisions in this part of the section.</p> <p>The existing MUTCD offers a broad option statement that covers the use of chevron and diagonal markings, indicating that they may be used on “shoulders, gore areas, flush median areas between solid double yellow center line markings . . .”, etc. I support retaining the existing MUTCD text, which allows practitioners the flexibility to decide when and where chevron/diagonal markings are most needed in the context of an individual agency’s street network and marking budget.</p> <p>I understand the desire to upgrade the use of these markings to guidance in certain situations, but the extensive situations proposed on p. 363, lines 26-37, and p. 364, lines 6-10, are much too broad. I suspect the breadth of these guidance statements is what led the NCUTCD to recommend the conversion of the guidance to options.</p> <p>I suggest narrowing the list of circumstances where such markings are recommended to the bare minimum that are supported by research and/or communicated by the automated-vehicle industry. For instance, perhaps the guidance should refer to neutral areas greater than, say, 5’ wide and 200’ long, where the width and length makes them more likely to be mistaken by an AV as a travel lane. The AV industry should not need chevron/diagonal markings at all the locations listed when considering the vast array of roadways and circumstances that exist in the U.S.</p> <p>The word “or” is used to separate most of the items on p. 363, lines 26-37, and p. 364, lines 7-8, but the word “and” is used on p. 363, line 36. I believe the word “and” is more correct and should be used exclusively here.</p>

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3B.25	NO	YES	N/A	<p>The guidance statement on p. 364, lines 25-32, has a logic error. It recommends markings at least 12" wide on roadways with speed limits of 45 mph or greater and 8" wide on roadways with speed limits less than 45 mph. These two conditions were appropriately described in the 2009 MUTCD because they encompass all of the possible speed limits and designate a certain marking width for each. The NPA proposes a third tier for streets with operating speeds less than 25 mph. If this tier is adopted, the text describing the second tier needs to be changed, because as currently written, the second tier still recommends 8" markings for all speed limits less than 45 mph, even those where the operating speed is less than 25 mph.</p> <p>It is curious that the first two tiers refer to speed limits and the third, proposed, tier switches to operating speed. It would be easier to describe the second tier if the same speed measure were used for all three.</p>
3B.30, 3B.31	NO	NO	NO	Figures 3B-28 and 3B-29 are missing from the NPA package.
3C.01	NO	YES	N/A	The use of "roadway" on p. 368, line 30, is incorrect, because on roads with shoulders, curb ramps are typically located outside the shoulders.
3C.07	NO	YES	N/A	<p>In Sec. 3C.07, the name "perpendicular crosswalks" and the definition, in which the longitudinal and transverse components are perpendicular, introduces a conflict for cases where a crosswalk is on a skew. Guidance in Sec. 3C.05, p. 371, lines 30-31, recommends that longitudinal elements should be parallel to approaching traffic, which I support. I suggest renaming "perpendicular" to something else.</p> <p>It is unclear what is meant by "diagonal walking between crosswalks" on p. 372, line 3. I suspect this could be deleted without degrading the MUTCD because it is in a support statement. If it is essential to retain this concept, it needs to be described more clearly or presented in a figure.</p> <p>I also suggest deleting the paragraph on p. 372, lines 13-16, because it is unclear what is being described. Appropriate guidance remains as indicated in Sec. 3C.05, that the longitudinal bars should be parallel to approaching traffic. By advocating rotating the bars by up to 45 degrees, this paragraph could confuse some MUTCD users to think that the bars should not be parallel to approaching traffic.</p>
3C.08	NO	YES	N/A	The name "longitudinal bar pair" in the section title and text is not consistent with the description of this treatment in Fig. 3C-1. I support the name "bar pair".
3C.11	NO	YES	N/A	The guidance on p. 373, lines 26-27, should be reworded for clarity. I suggest: "Crosswalks should be designated on the most direct pedestrian paths to minimize the number of pedestrian crossings outside crosswalks."
3D.06	NO	YES	N/A	On p. 376, line 31, the word "circular" should be "circulatory."
3E.02	NO	YES	N/A	<p>On p. 378, line 25, the use of "edge lines" is incorrect. "Edge line" is defined as a line that marks the edge of the traveled way. In the application described in Sec. 3E.02, the markings described are not at the edge of the traveled way.</p> <p>This comment also applies to Table 3E-1.</p>

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				<p>Also in Table 3E-1, the title of the table mentions lane lines, but “lane lines” are not mentioned in the body of the table.</p> <p>In Table 3E-2, the column headings do not distinguish clearly which markings each column refers to. The column headings should refer, for instance, to the “lane line on the left-hand side of the preferential lane”, etc.</p>
3E.02	NO	YES	N/A	On p. 378, line 26, the word “shall” is missing after “direction.”
3E.04	NO	YES	N/A	<p>On p. 383, lines 6-7, I suggest deleting “to provide for transit or HOV priority or to provide higher throughput at reduced speeds when open to all traffic.” As noted in an earlier comment, the signing and marking needs for bus use of shoulders is typically very different than use by general-purpose traffic. It is preferable not to conflate these uses in this support statement. Also, the mention of reduced speeds implies that a speed limit reduction is needed or encouraged when shoulders are opened to motor vehicle travel. In my experience, agencies do not always reduce the speed limit when shoulders are opened to motor vehicle travel, and I do not find any recommendations or requirements to this effect in the NPA.</p> <p>On p. 383, lines 29-30, it may be preferable not to refer to the line as an “edge line,” because “edge line” is defined in Sec. 1C.02, p. 19, line 7, as delineating the edge of the traveled way. As noted in an earlier comment, there is ambiguity in the definition of “traveled way” about whether it includes shoulders open to part-time motor vehicle use. In any case, it would be very helpful to provide clear names for the longitudinal markings on both sides of the shoulder travel lane (considering conditions when the shoulder open to motor vehicle travel is on both the left and right sides of the roadway) so the text and figures can be very clear about the location and characteristics of each line.</p> <p>On the same page, also on line 29, the phrase “on the shoulder” is not very precise. Presumably the line should be on one edge of the shoulder or the other.</p> <p>On p. 383, line 39, the wording could be improved. I suggest rewording as, “Red-colored pavement (see Section 3H.07) may be used on shoulders that allow only transit vehicles.”</p>
3H.01	NO	NO	YES	<p>On p. 389, lines 12-13, the changes to the text mean that (non-retroreflective) colored pavement is considered a traffic control device only when used “within the traveled way.” As such, it appears that non-retroreflective colored pavement can be used on shoulders and not be subject to regulation or control by the MUTCD. As worded in the NPA, this is true even if the colored pavement on the shoulder is used to “regulate, warn, guide, or otherwise communicate with traffic.” Is this the intent of the changes proposed in the NPA? Considering FHWA’s recent concerns about colored pavement (such as Official Ruling 3(09)-24(I)), it is surprising that the NPA would include such a remarkable loosening of control over colored pavements on shoulders.</p> <p>On the same page, I suggest striking “as a traffic control device” from line 22 and “as traffic control devices” from line 25. The paragraph that begins on line 12 clarifies when colored pavement is considered a traffic control device, so it is not necessary to repeat this information on subsequent mentions of the term “colored pavement”. Further uses of “colored pavement” in Chapter 3H appropriately are proposed not include the qualifier “as a traffic</p>

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				<p>control device”. The fact that some mentions of “colored pavement” include this qualifier and others don’t could cause confusion among readers about exactly what colored pavements are being discussed.</p> <p>If FHWA determines that it is necessary to retain these qualifiers on lines 22 and 25 despite this suggestion, then they should either both be singular or both be plural rather than one of each.</p>
3H.03	NO	NO	YES	<p>The paragraph that starts on p. 390, line 14, has been proposed to be moved from a general discussion about colored pavements in the 2009 MUTCD to a new section that specifically relates to aesthetic treatments in crosswalks in the NPA. While the text of the paragraph has only minor changes, its relocation to Sec. 3H.03 considerably changes its meaning. In the 2009 MUTCD, the paragraph uses “between the lines of a crosswalk” as an example of an aesthetic treatment. However, the paragraph broadly permits “aesthetic treatments” anywhere and is not limited to just crosswalks. This flexibility is essential to provide agencies the ability to use, for instance, brick patterns in intersections—a very common urban application. The new location of the paragraph suggests that this flexibility only applies in crosswalks. I strongly oppose this change.</p> <p>I suggest relocating this paragraph to Sec. 3H.01 where it can fulfill the same intent as it does in the 2009 MUTCD.</p> <p>On the same page, line 20, I disagree with the assertion “Since the right-of-way is dedicated exclusively to highway-related functions”. There are many examples of other functions fulfilled by highways, such as block parties or even conversations between people who meet on the sidewalk. This text contributes to the perception that the MUTCD is overly focused on automobile travel. The paragraph retains its meaning with this text removed.</p> <p>In general, I do not support the limitations on aesthetic treatments in crosswalks proposed to be added to this section.</p>
3H.04	NO	YES	N/A	<p>As noted in an earlier comment, the NPA proposes not to regulate colored pavements on shoulders as traffic control devices anymore, according to the proposed revisions to Sec. 3H.01, p. 389, lines 12-13. However, text on p. 391, lines 9 and 10, mentions use of yellow pavement on shoulders. It is not consistent to mention shoulders in Sec. 3H.04 when shoulders are not included in Sec. 3H.01.</p>
3H.05	NO	YES	N/A	<p>As noted in an earlier comment, the NPA proposes not to regulate colored pavements on shoulders as traffic control devices anymore, according to the proposed revisions to Sec. 3H.01, p. 389, lines 12-13. However, text on p. 391, lines 26, 30, and 33, mention use of white pavement on shoulders. It is not consistent to mention shoulders in Sec. 3H.05 when shoulders are not included in Sec. 3H.01.</p>
3H.06	NO	YES	N/A	<p>On p. 392, lines 8-15, some of the items in the list are singular and others are plural. They should be consistent.</p> <p>I support the proposed standard on p. 392, lines 16-17, to disallow use of green pavement with shared-lane markings. I believe that the use of solid green colored pavement implies a dedicated bicycling facility, and use of green with shared-lane markings is not consistent with this intent.</p>
3J.03	NO	YES	N/A	<p>In Fig. 3J-2, drawing B, it appears that the double white line must be an error.</p>

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3J.07	NO	NO	YES	<p>The proposed paragraph on p. 400, lines 7-9, reads: “For the purposes of this Section, the paved areas between the solid double line forming the curb extension (see Paragraph 4 of this Section) and the sidewalk or other roadside area are considered to be outside of the street.”</p> <p>This is a very curious paragraph. According to Sec. 1C.02, p. 30, line 14, the word “street” means the same as “highway”: “the entire area within the right-of-way.” Why would curb extensions need to be excluded from the highway right-of-way? Are they intended to be privately owned and maintained? Even curb extensions constructed with physical curbs remain within the highway right-of-way, so why would markings be so vastly different?</p> <p>It is also curious that the paragraph applies this exclusion only “for the purposes of this Section.” Apparently this means that for all the other hundreds of sections in the MUTCD, the curb extension area <i>is</i> considered part of the street. After reviewing the rest of Sec. 3J.07, I do not find anything that requires a different definition to apply in this section only.</p> <p>Instead, I find additional conflicts. The paragraph that begins on line 24 recommends diagonal markings or colored pavements for the curb extension area, but the MUTCD only regulates use of these markings on “streets and highways”. If the curb extension is not part of the street, the MUTCD has no control or authority on whether any markings are placed there, and it has no authority to promulgate such guidance. Likewise, the MUTCD has no authority to issue the guidance on lines 31-32 about pedestrian markings outside the street.</p> <p>If a crosswalk with a marked curb extension were signalized, presumably the provisions in Part 4 would consider the curb extension area to be within the street, for the purposes of, for instance, pedestrian clearance timing.</p> <p>In general, I oppose definitions of terms that change “for the purposes of” a single section. An MUTCD user is not going to be able to appreciate such subtle differences in terminology. Ultimately, MUTCD users must decide on signs and markings, and it is not feasible for them to be required to make these decisions subject to changes in terminology on a section-by-section basis. No traffic control device has its roots in only one section of the MUTCD, so such a distinction is not possible.</p> <p>Furthermore, the paragraph that begins on line 27 takes pains to point out the differences between curb extensions and “areas where travel is discouraged by the presence of diagonal markings.” If the exact same diagonal markings are recommended on lines 24-25, how can a motorist appreciate the fundamental difference expressed on lines 27-29 between curb extensions and other areas identically marked?</p> <p>There are several inconsistencies in Fig. 3J-6 related to the “street” issue. The MUTCD should not show crosswalk markings in the curb extension area if it is “outside the street” because it is impossible to have a marked crosswalk outside of the street. The presence of the detectable warning surfaces is also inconsistent with this definition.</p>
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				<p>I am sure that FHWA had a particular rationale in writing and including this paragraph. It would be very helpful to include this rationale in the paragraph so readers could understand why such a fundamental shift is necessary.</p> <p>Frankly, I do not understand why Sec. 3J.07 is necessary at all. Sec. 3J.07 delves into traffic engineering design guidance and strays from the manual's mission to focus on traffic control devices. There is nothing in the rest of the MUTCD that limits an agency's ability to implement this treatment even in the absence of this section. The provisions in the remainder of the MUTCD provide ample information on how practitioners can sign and mark areas so designated even without Sec. 3J.07.</p> <p>There are so many conflicts in the language of the section that it makes much more sense to delete it entirely.</p>
4A.06	NO	YES	N/A	<p>On p. 406, lines 18-19, the NPA proposes to change 2009 MUTCD text from "some other island or pedestrian refuge area" to "a safety island." The term "safety island" is not defined or used elsewhere in the MUTCD or NPA, so it is odd that the NPA would expressly use the term here when the 2009 language was sufficiently clear. Readers are likely to wonder if there are particular characteristics of a conventional island that make it meet or fail to meet a stringent definition of "safety island". It does not appear that any such definition exists or has been proposed. As such, to avoid confusion, I suggest reverting to the 2009 MUTCD language or otherwise omitting the term "safety island."</p>
4C.01	NO	YES	N/A	<p>I have the following comments on text proposed to be added on p. 413, lines 1-3:</p> <ul style="list-style-type: none"> • This text is proposed to be added amidst a series of guidance paragraphs, each of which has a different topic area. The meat of the paragraph that begins on p. 412, line 38, discusses "major-street approach[es] with one lane for through and right-turning traffic plus a left-turn lane". The paragraph that begins on the same page, line 47, relates to "minor-street approach[es] with one through/left-turn lane plus a right-turn lane." The added text relates to neither of these, so it is probably better positioned in its own new paragraph rather than appended to the paragraph that starts on line 47. • The text appears to assume, but does not specify, that it relates only to minor-street approaches with two lanes (for instance, by use of the word "both"). Suggested revised text is as follows: "If a minor-street approach has one through/right-turn lane plus a left-turn lane . . ." This structure is consistent with the prior paragraphs. • In line 3, the superlative "highest" should be replaced with the comparative "higher" because there are only two lanes under consideration.
4D.05	NO	YES	N/A	<p>A new standard proposed on p. 426, lines 47-48 would prohibit "ancillary legends" on backplates, but only when they "identify the purpose or operation of the signal face". I suggest prohibiting all legends on backplates, regardless of purpose, and regardless of whether someone considers them "ancillary". The proposed standard could be shortened to read, "Legends shall not be used on backplates."</p>
4D.08	NO	YES	N/A	<p>On p. 428, lines 42 and 49, "roadway" should be "roadway or shoulder".</p>

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4D.09	NO	YES	N/A	On p. 429, lines 30, “with curbs” should be deleted, because the paragraph applies to roadways both with and without curbs.
4F.04	NO	YES	N/A	<p>I disagree with the way Official Change Request 4(09)-42 has been proposed for incorporation in the MUTCD on p. 442, lines 28-30. As proposed, the text essentially says a certain signal display “shall not be used” “unless” the equipment is “capable” of the display. This is awkward language and can lead to confusion.</p> <p>The change request means that there are now two options for this display. The text should read something like the following:</p> <p>“During steady mode (stop-and-go) operation, one of the following displays shall be used:</p> <ul style="list-style-type: none"> • The signal section that displays the flashing left-turn YELLOW ARROW indication shall also be used to display the steady left-turn YELLOW ARROW indication, or • Separate signal sections shall be used to display the flashing left-turn YELLOW ARROW indication and the steady left-turn YELLOW ARROW signal indication.” <p>This comment also applies to Sec. 4F.11, p. 449, lines 39-41.</p>
4H.01	NO	YES	N/A	<p>On p. 464, line 15, item E in the list should start with “To” for parallelism.</p> <p>On the same page, the standard on lines 28-31 specifically mentions “right (or left) turns on red from the same approach as the bicycle movement.” This leaves readers to wonder whether turns on red from other movements are also included, but a plain reading of the preceding text suggests that they are. This could cause confusion. I suggest striking “from the same approach as the bicycle movement” to clarify that the standard applies to all turns on red.</p>
4H.10	NO	YES	N/A	On p. 467, line 37, “roadway” should be “roadway or shoulder”.
4H.12	NO	YES	N/A	P. 468, lines 10-11, asserts that the “exclusive function” of a yellow interval is to warn bicyclists of an impending signal change. I disagree with this notion. In some states, the yellow indication also has legal consequences related to the state’s definition of red-light running. It does not appear that “exclusive function” is necessary or even helpful to the sentence, so I suggest that it be deleted.
4I.01	NO	YES	N/A	<p>The guidance proposed on p. 469, lines 11-13 could be read to mean that accessible signals <i>always</i> “should be provided,” which is not the intended meaning. I suggest rewording to start the paragraph with “Where pedestrian signals are used, . . .”</p> <p>Also, the text related to the study is unclear as proposed. It should be revised to read, “if determined to be necessary by an engineering study . . .”</p>
N/A	NO	YES	N/A	Throughout the proposed NPA text and figures, I observe that the word “pushbutton” is sometimes used with a space between “push” and “button” and sometimes without. I suggest that this term use the same spacing convention on each use.
4I.05, 9F	NO	NO	YES	<p>I encourage FHWA to provide additional provisions in the MUTCD related to pushbuttons for bicyclists. The text in Sec. 4I.05 relates expressly to pushbuttons for pedestrian use, and no provisions are provided in Part 9 related to pushbuttons for cyclists.</p> <p>At many signalized intersections, bicyclists on the minor street approach are required to actuate a pushbutton to get a green indication, when there are no motor vehicles waiting on the same or</p>

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				<p>the opposing approach. The locations of pushbuttons, as described in Sec. 4I.05, are not optimal for use by bicyclists. In fact, the pushbutton locations described in Sec. 4I.05 often result in pushbuttons that are very difficult for bicyclists to even identify, let alone use. At some signals, pushbuttons are located such that a bicyclist at a typical stopping position adjacent to the curb at the stop line cannot even discern whether the intersection has pushbutton-actuated crossings at all, because the pushbuttons are located on the far side of the signal pole from the bicyclist, a position that is entirely permissible and encouraged from the text and figures in Sec. 4I.05.</p> <p>When a bicyclist must leave the street and enter the sidewalk to actuate a pushbutton, the cyclist is not able to take advantage of the optimal positioning and visibility provided by remaining in the street. For instance, the main concept behind the bicycle box (Sec. 9E.12) is to encourage cyclists to remain in the sight line of motorists on the same approach. If cyclists are required to leave the street to actuate a pushbutton, they end up in a position much different than a bicycle box would suggest is ideal.</p> <p>Even the name used for these devices in Sec. 4I.05, “pedestrian push buttons,” does not alert MUTCD users that they are essential for use by bicyclists as well as pedestrians.</p> <p>Some states have policies that have resulted in more widespread passive detection of bicyclists at signals, but in other states, passive bicyclist detection is rare. In most of the U.S., it is expected that pushbuttons will be the primary way for bicyclists to actuate signals for the foreseeable future. Newer pushbuttons also have the advantage of a light or tone that acknowledges actuation, which often is not provided with passive bicycle detection.</p> <p>I suggest that a section be added to Chapter 9F to describe the optimal placement of pushbuttons intended for use by bicyclists. The best such pushbuttons are located immediately adjacent to a bike lane at the stop line, so cyclists can actuate them without leaving the bike lane from a point where a stop is required in any case. (However, such devices are also effective and appropriate on streets without bike lanes.)</p> <p>Many agencies use bicyclist pushbuttons—it does not appear that such devices require approval of a request to experiment. One example of such device in Phoenix is on Eastbound Encanto Blvd. at 7th Ave. However, I am not aware of any provisions in the MUTCD for standard location, height, or signing for bicyclist pushbuttons. It is also not always clear whether such pushbuttons actuate the pedestrian phase or only a (much shorter) vehicular phase.</p> <p>Sec. 4I.05 needs to be modified to recognize the coexistence of bicyclist and pedestrian pushbuttons. For instance, p. 472, line 30, refers to a condition “where two pedestrian push buttons are provided on the same corner.” However, what if both of these pushbuttons actuate the same crossing? On the same page, line 34 also discusses separation between “the two pedestrian push buttons” without considering that there could be buttons for both pedestrians and bicyclists.</p>
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41.06	NO	NO	YES	<p>I oppose the standard proposed to be added on p. 475, lines 25-27. In order for agencies to use LPIs, this standard would require them to either:</p> <ul style="list-style-type: none"> • Use accessible pedestrian signals (APS), or • Lengthen the red phase of conflicting (usually major-street) traffic by the duration of the LPI. <p>My former agency has implemented a series of “elongated” LPIs² that have proven very successful in addressing pedestrian safety issues. These treatments are a hybrid between LPIs and exclusive pedestrian phasing, and often consist of an LPI that is 20 seconds or more in duration. At these locations, agencies typically provide a standard 7-second WALK followed by the appropriate flashing DONT WALK indication. At some point during the flashing DONT WALK indication, concurrent vehicular traffic is released with a concurrent green indication.</p> <p>In this case, the WALK indication is not used for the entire duration of the LPI, which violates the premise of the text on lines 26-27, “in addition to the time provided for the leading pedestrian interval.” Elongated LPIs only work when the WALK indication remains reasonably short, because it allows the total side-street phase to remain roughly the same length, allowing red time for main street traffic to remain relatively unchanged.</p> <p>While I understand the needs of pedestrians with visual disabilities, I do not agree that mandating either APS or a phase lengthening is necessary in all cases. For one thing, when a person with visual disabilities crosses the street on a WALK indication, there is no guarantee that any vehicles will be on the concurrent approach. This is particularly true for low-volume approaches. I understand that the sound of vehicles is often a cue to low-vision pedestrians, but at low-volume intersections, pedestrians must be able to navigate even without this cue. If the MUTCD permits them to navigate low-volume intersections without LPIs, the mere presence of an LPI should not justify such an extreme standard.</p> <p>Many suburban intersections have very low pedestrian volumes, and the dearth of pedestrians is one reason why LPIs are so essential in the suburbs: drivers are not used to looking for pedestrians and need a reminder to stay stopped while pedestrians start crossing. LPIs (and elongated LPIs) are feasible at intersections even with one or two pedestrians per day, because they do not increase the red time for the high-volume major street movement. Conventional LPIs are easy to implement and can typically be installed from the signal control center without a field visit. This makes them among the countermeasures that are most responsive to public complaints. A pedestrian can contact an agency about a problematic intersection, and within a day or two, the pedestrian finds the problem solved with an LPI.</p> <p>Both elements this standard requires threaten the viability and effectiveness of LPIs. APS represent a significant investment in evaluation, design, funding, and construction before they can be used. An agency required to use APS at all LPI locations will be</p>
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² See also: Dittberner, Randy, and Vu, Nhan, “How Long Is Your LPI? Balancing Pedestrian Comfort and Traffic Impacts with an Elongated LPI,” *ITE Journal*, December 2017.

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				<p>unable to implement LPIs as quickly or as ubiquitously, and both of these pose pedestrian safety implications.</p> <p>At some suburban intersections, the volume of sighted pedestrians is exceedingly low, so low that the probability of a pedestrian with visual disabilities is infinitesimal. Just as APS are not mandated at all pedestrian signals, so too should APS not be mandated at all LPIs. In addition, the locator tone emitted by APS equipment is a source of neighborhood complaints, particularly when nearby residents want to open their windows during pleasant weather. It is not always possible to adjust the volume of the locator tone to avoid noise pollution near the intersection, which is a source of complaints and a reason (alone) why an LPI may not be feasible.</p> <p>Likewise, when an agency is required to lengthen the major street red time to implement an LPI, the agency may determine that the LPI is not feasible at all due to peak-hour traffic impacts. This is particularly true for elongated LPIs that could add on the order of 20 seconds to the major-street red time if this standard were adopted.</p> <p>It is clear that the proposed standard will reduce the number of intersections with LPIs and those that are LPI candidates, just as this treatment is gaining traction as an FHWA proven safety countermeasure. Therefore, a key question is: Is it acceptable to have fewer LPIs to ensure those that do exist are as friendly as possible to pedestrians with visual disabilities? My answer to that question is a resounding no. Reducing the number of LPIs is likely to increase pedestrian crashes and threatens agencies' ability to respond to their constituents with this high-potency countermeasure that is quick to install and has negligible impacts on mainline traffic.</p> <p>This question reminds me of the debate around bicycle helmets. Sure, it would be great if all cyclists wore helmets. But if helmets are mandatory, then the side effect is that fewer people will choose to ride, and this trend is not desirable. As such, we live with helmets as a recommended safety device but leave the ultimate decision to each bicyclist to make for themselves.</p> <p>I urge FHWA to use similar rationale around LPIs. Please allow each agency to weigh the pros and cons and decide for themselves whether an LPI also needs APS or longer major-street red time. If so, they should be permitted and encouraged to implement one or the other or both. But agencies that determine that neither of these treatments are necessary also need to continue to have access to the proven safety benefits of an LPI.</p> <p>I believe this could be accomplished by converting this proposed standard to guidance and by adding support discussing the related tradeoffs.</p>
4J.01	NO	NO	YES	<p>I do not support the option proposed on p. 476, lines 43-45, which allows agencies to consider each direction of the mainline separately in considering PHBs. I understand that this text was derived from Official Interpretation 4(09)-25(I); however, the interpretation focuses exclusively on traffic signal warrants, not PHBs.</p> <p>There appear to be two ways that this option statement could be interpreted by MUTCD readers:</p>

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				<ul style="list-style-type: none"> If the volumes are notably different by direction on a major street, an agency may decide (relying on this option statement) that a PHB should be used to control crossing of one direction of the major street but not the other direction. I believe the MUTCD needs to do all it can to avoid this interpretation, because it could pose a severe safety problem. The option would appear to allow agencies not to install PHBs at some locations whether they would otherwise satisfy the volumes in Fig. 4J-1 or 4J-2. <p>However, agencies already have the option not to install PHBs if they choose. A PHB is an optional device and nothing in the MUTCD ever mandates or recommends that one be installed, even under high-volume conditions.</p> <p>Because the second bullet appears to be redundant (agencies already have the option not to install a PHB), I suggest that this option statement should be deleted to avoid the misinterpretation in the first bullet.</p>
4J.02	NO	YES	N/A	On p. 478, line 35, is guidance that the flashing yellow interval should not vary on a cycle-by-cycle basis. However, this guidance indicates that it applies (according to line 34) when a PHB is coordinated. On the contrary, the flashing yellow interval should never vary on a cycle-by-cycle basis, whether a PHB is coordinated or not. As such, I suggest moving line 35 to its own paragraph rather than being tied to coordinated PHBs by line 34.
4K.01	NO	YES	N/A	The sentence that starts on p. 480, line 44, needs to start with "Where accessible pedestrian signals are used, . . ." to ensure that readers do not infer that APS are recommended everywhere.
4L.01	NO	YES	N/A	<p>P. 487, lines 21-24, discusses optional use of an RRFB in advance of the crosswalk. However, this option is limited to cases where sight distance is "less than deemed necessary by the engineer". Agencies should be permitted to use an optional advance RRFB at any RRFB crossing. Such use should not be limited to locations with sight distance "less than deemed necessary". The proposed wording could inappropriately encourage MUTCD users to consider RRFBs at locations with grossly insufficient sight distance, and this interpretation would be counter to pedestrian safety.</p> <p>I suggest deleting the clause about sight distance and starting the sentence with "An additional RRFB may be installed . . ."</p>
4P.03	NO	YES	N/A	On p. 496, lines 35-37, I suggest deleting "to inform road users that the ramp control signal is in operation." Flashing LED units should never be used with this sign because of the potential for confusion with the flashing status of the required warning beacon.
4S.03	NO	YES	N/A	The new sentence proposed to be added on p. 502, lines 28-30, is rendered as support, but it appears to provide direction to practitioners. I suggest revising this sentence to guidance or a standard to ensure that it is sufficiently respected.
4T.01	NO	YES	N/A	The word "roadway" on p. 504, line 6, should be expanded to acknowledge that lane-use control signals are also permissible over shoulders that are open to part-time motor-vehicle travel. (This comment presumes that the definition of lane-use control signal in Sec. 1C.02 is modified, as recommended by an earlier comment.)
4T.02	NO	YES	N/A	<p>P. 504, lines 45-48, describes the meaning of the steady yellow X. There are actually two cases where the steady yellow X is used:</p> <ul style="list-style-type: none"> A temporal condition, in which one particular sign transitions from displaying a yellow X to a red X. This could

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				<p>be used where a managed lane is preparing to close. If so, an entire series of signs may simultaneously transition from yellow X to red X.</p> <ul style="list-style-type: none"> A <i>spatial</i> condition, in which one sign displays a yellow X and a downstream sign displays a red X. This might be used in the event of a downstream incident or work-zone lane closure. <p>The text in lines 45-48 uses words that are ambiguous about whether they refer to the temporal or spatial condition. (For instance, “followed by” could mean followed in time or space.) I suggest revising the language to specifically acknowledge that the yellow X has both temporal and spatial meanings.</p>
Part 5	NO	YES	N/A	<p>I concur with the NCUTCD recommendation to convert Part 5 to entirely support statements with no guidance or standards. Users cannot be expected to find standards related to pavement markings, signing, TTC, or other devices in Part 5. Any relevant standards need to be in the appropriate part of the MUTCD.</p>
5B.02	NO	YES	N/A	<p>The meaning of the word “continuous” is not clear on p. 513, line 39. Is the intent that markings be “solid”? I suggest using the same terminology as Part 3.</p> <p>On the same page, line 44, it is curious that AVs benefit from avoiding decorative elements “in crosswalks,” but apparently do not benefit from avoiding decorative elements elsewhere on streets, as apparently permitted by Chapter 3H. I am not familiar with the detailed needs of AV developers, but this specificity seems odd.</p>
6A.02	NO	YES	N/A	<p>On p. 519, lines 36, the word “the” should be “to”.</p> <p>On the same line, the word “will” should be changed to “might” or “could” to indicate that it is not a certainty that demand will exceed capacity just because one or more lanes are closed.</p> <p>On the same page, lines 34 and 42 use the phrase “roadway or freeway,” which is not precise because a freeway is a “highway”, as defined in Sec. 1C.02, but a roadway includes only a portion of the “highway”. The distinction provided by the word “or” does not seem necessary to the context of the paragraph. As such, I suggest deleting “or freeway” on both lines.</p>
6B.04	NO	YES	N/A	<p>The purpose of the text after the asterisk on p. 527, line 15, is not clear. Does this asterisk refer to the figure? If so, typically the note would be on the figure itself, not part of the MUTCD text. There do not appear to be any asterisks in the text of Sec. 6B.04 that this line is intended to apply to.</p> <p>Also, the word “site” is missing before “roadways”.</p>
6H.32	NO	YES	N/A	<p>On p. 558, lines 3-4, the reference to “AASHTO and ITE design documents” is not very helpful to practitioners because it doesn't provide any detailed references. It isn't feasible for practitioners to conduct a comprehensive search of all AASHTO and ITE publications to find the relevant information. If this is all the detail that can be provided in the support statement, it is probably better to do without it. Furthermore, it is not clear what distinguishes a “design document” from any other document or why the word “design” was included.</p>
6J.01	NO	YES	N/A	<p>On p. 562, lines 20-23, a standard statement is proposed to be changed to guidance. This change causes an inconsistency with Sec. 5B.04, p. 514, lines 32-36, which proposes a standard for these markings.</p>

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				However, as noted earlier, I support removal of the standard statements from Part 5. I also support the conversion of this standard to guidance in Sec. 6J.01.
6K.02	NO	YES	N/A	On line 47, I suggest changing the reference to “detection plates” instead of “surfaces” to be clearer and to be consistent with Fig. 6K-2.
6M.02	NO	YES	N/A	I disagree with the assertion in white/green text on p. 586, line 42, that the support statements proposed for deletion are redundant with the new support statements. Notably, two of the four “primary functions” proposed for deletion mention pedestrians and bicyclists, but none of the support statements proposed to be added mention pedestrians, bicyclists, or any alternative travel modes. I suggest retaining the text proposed for deletion on lines 37-42.
6M.04	NO	YES	N/A	The proposed deletion of the first part of the guidance statement on p. 588, lines 21-22, makes it sound like detectable edging is recommended in all work zones, which is certainly not the case. I support retaining the 2009 language proposed for deletion. However, if FHWA determines that it is essential to delete this text, line 22 should be modified to read, “throughout the length of a temporary pedestrian facility . . .”
6M.06	NO	YES	N/A	I request that FHWA add the word “paved” to the sentence on p. 590, lines 42-43. Shoulders can be wholly or partially unpaved, per the definition in Sec. 1C.02, p. 28, lines 20-21. Certainly, shoulder rumble strips can only be used on the paved portion of a shoulder, but the guidance statement should recommend that a minimum paved clear path of 4 feet be available on the shoulder for bicyclists.
6N.01	NO	YES	N/A	On p. 592, lines 24-25, a standard statement is proposed to be changed to guidance. This change causes an inconsistency with Sec. 5B.04, p. 514, lines 32-36, which proposes a standard for these markings. However, as noted earlier, I support removal of the standard statements from Part 5. I also support the conversion of this standard to guidance in Sec. 6N.01. This sentence also should be modified to clarify that it applies only to long-term stationary TTC zones.
6N.05	NO	YES	N/A	On p. 596, the term “outside the shoulder” is used synonymously with “off the roadway” even though they are not the same. A shoulder itself is “off the roadway.”
6N.13	NO	YES	N/A	P. 602, lines 28-33, repeats the paragraph that starts on p. 519, line 36. It is not clear why this information needs to be provided twice. In general, the MUTCD should strive to include every provision exactly once to minimize its length. However, if it is determined that this paragraph is needed in both places, my earlier comments on Sec. 6A.02 also apply here.
6N.19	NO	YES	N/A	On p. 605, lines 6-7, I ask that FHWA revise the sentence to avoid using the text “many of the problems”. I do not think it is advisable that the MUTCD conflate lane closures with “many problems” because lane closures occur both within and outside work zones, and this language could pose a liability concern for agencies. I believe the intent of the sentence is retained by shortening it to read, for instance, “The Late Merge can affect queue length and driver satisfaction.”

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				<p>I am not aware that the late merge has any impact on capacity, so my proposed revision above omits this word. A review of the most recent version of the <i>Highway Capacity Manual</i> does not identify any adjustment to work zone capacity caused by use of a late merge on its approach.</p> <p>On the same page, line 14, the text “if used” is not needed.</p> <p>It is not clear why specific CMS messages are proposed in Sec. 6N.19, p. 605, lines 16-22 for the late merge application, when specific CMS messages are generally not provided for other TTC strategies. I ask FHWA to consider whether some or all of these messages could be deleted. However, if they must be retained, the word “STOP” in line 21 should be changed to “STOPPED.”</p>
6P.01	NO	YES	N/A	<p>On Fig. 6P-29, I suggest not using “cross-hatching” in the note, because this term is not used in the text of the MUTCD to describe an optional crosswalk marking treatment.</p> <p>On Fig. 6P-47, 48, and 50, I ask that FHWA not use a SHARE THE ROAD plaque. This plaque has been removed from Chapter 2C. If a plaque is shown on these figures, it should be IN STREET or IN ROAD to be consistent with Sec. 2C.54, p. 145, line 27.</p> <p>The notes for TA-47 on p. 660, line 13, suggest a plaque with the text “ON STREET or ON ROADWAY”. I suggest using “IN STREET or IN ROAD” to be consistent with Sec. 2C.54.</p> <p>The convention in the TA figures appears to be that shoulders are shown in a slightly lighter shade of grey than the roadway. However, in TA-47 and TA-48, the bike lanes are shown in the lighter grey. Why? Bike lanes are part of the roadway. This is not consistent with the way bike lanes are depicted in the figures in Part 9. Using the lighter grey color could contribute to the mistaken notion that bike lanes and shoulders are synonymous for TTC purposes.</p> <p>The title of TA-48 indicates that it refers to a “bicycle lane closure”, but the figure shows no permanent signs or markings that give readers any indication that this figure shows bike lanes and not shoulders. The figure needs to show, at least, bike lane markings.</p> <p>On TA-48 and TA-50, the symbol “<=” is missing between “Lane Width” and “14”.</p> <p>The notes for TA-48 (p. 661, line 6) and TA-50 (p. 663, line 5) refer to “roadway”. These should say “roadway or shoulder” to acknowledge that the shoulder is often a far preferable riding location for cyclists than the roadway.</p> <p>In TA-51, the sign legends “DIVERSION” and “RETURN TO SHOULDER” are very long, and the signs generally appear unnecessary. It is not clear why such signs would be necessary for a shoulder closure but not for a path or road closure (TA-49 and TA-39, respectively). The sign “RETURN TO SHOULDER” is almost certainly never necessary. This condition is obvious and does not require a warning sign.</p> <p>The notes for TA-52, p. 665, line 20, offers an option that “crosswalks may be closed.” This brief option appears to conflict</p>

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				<p>with other guidance in Part 6 that pedestrians be offered passage through work zones. If crosswalks are closed, what is to become of pedestrians passing through the work zone? Does the option intend to allow closure of all crosswalks at a circular intersection? Are there any criteria that justify closing a crosswalk (such as direct conflict with a work area) or is it possible to close all crosswalks just for the convenience of the work crew, so they don't have to post any other TTC devices for pedestrians? If crosswalks are closed, do pedestrian detours need to be arranged? The notes need to be much more specific about these elements before offering the broad option to close crosswalks. The standard statement from TA-53, p. 666, lines 8-11, would be a good start.</p> <p>The notes for TA-53, p. 666, line 25, provide guidance about removing conflicting pavement markings in long-term work zones. However, this provision is rendered as a standard in Sec. 5B.04, p. 514, lines 32-36. As previously noted, I support the NCUTCD recommendations to remove the standards from Part 5; if this action is taken, then I support the text in TA-53. This comment applies to several subsequent TA notes as well.</p> <p>The notes for TA-53, p. 666, lines 29-32, have several stray digits.</p> <p>In the notes for TA-54, p. 667, line 30, the word "either" suggests that it is referring exclusively to a two-lane approach. I presume this option is also intended to apply to approaches with more than two lanes, in which case "either" should be changed to "any".</p>
8A.07	NO	YES	N/A	<p>On p. 685, line 21, the word "highway" should be "roadway".</p> <p>On the same page, line 29, the word "intersection" is qualified by "highway-highway". This qualifier seems unnecessary, because it seems that the paragraph should apply to all intersections beyond a grade crossing, not just highway-highway intersections. For instance, a pedestrian-only signal for a trail crossing is not currently included as a "highway-highway intersection."</p>
8E.02	NO	YES	N/A	<p>On p. 729, line 38, the word "sidewalk" should be "pathway or sidewalk" to be consistent with other use in this section (such as lines 30, 33, 42, and 46).</p> <p>On Fig. 8E-2 and 8E-3, the dimensions labeled "12' MIN" could be interpreted by a reader as though they are standards. However, on p. 729, lines 46-48, the dimension is indicated as support. It is unconventional to provide direction to practitioners in a support statement. If this statement is intended to be a guidance or standard, the text should be modified accordingly. Otherwise, I do not believe it is appropriate to provide these dimensions on Fig. 8E-2 and 8E-3.</p>
8E.03	NO	YES	N/A	<p>On p. 730, line 20, I suggest changing "pedestrians" to "sidewalk users" to acknowledge that other types of users can be found on sidewalks.</p>
8E.04	NO	YES	N/A	<p>On p. 731, the condition "if the surface where the marking is to be applied is capable of retaining the application of the marking" is used on lines 23-24 and lines 26-27, but not on lines 21-22 where it also seems relevant. The condition is probably not needed on lines 26-27 because this is an option statement.</p> <p>Fig. 8E-6 shows detectable warning surfaces on one sidewalk through a grade crossing but not on the sidewalk on the opposite side of the street. The reason for this is not immediately clear from</p>

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				looking at the figure. However, as shown, the figure appears to violate the standard on p. 732, lines 1-3, which requires detectable warnings “at sidewalk grade crossings”.
8E.05	NO	YES	N/A	On p. 732, line 20, I suggest changing “a grade crossing” to “the grade crossing.”.
8E.06	NO	YES	N/A	<p>In Fig. 8E-7, the retroreflective strip on the back of the sign should be yellow, because it will be on the left side of the pathway for path users approaching in the opposite direction, and yellow is the correct color for markings/delineators on the left-hand side.</p> <p>Since the guidance statement on p. 733, lines 19-21, is (correctly) proposed to be modified to remove mention of traffic control devices, it no longer seems to fall under the auspices of the MUTCD. I suggest deleting it or converting it to support, similar to subsequent paragraphs.</p> <p>It does not appear that the size of the DO NOT ENTER sign mentioned in the guidance statement on p. 733, lines 44-45, is specified anywhere in the MUTCD. It is probably not desirable to use the minimum size for roadways, which is specified in Table 2B-1 as 30 x 30, because sidewalk users can manage with much smaller sign installations. Also, it is possible that a DO NOT ENTER sign with dimensions typical of a roadway might confuse drivers to believe that this sign applies to vehicular traffic on the adjacent roadway, not solely to pedestrians.</p> <p>Because the option statement on p. 733, line 48, is not related to traffic control devices, it should be deleted or converted to support rather than an option.</p> <p>In Fig. 8E-8, Note 2 should be deleted or modified because it reads as though it is a guidance statement, but it is actually designated as support on p. 734, lines 12-14.</p>
8E.07	NO	YES	N/A	On p. 734, line 43, the reference to Chapter 4I seems to imply that the pedestrian crossing being discussed is signalized. The first part of the paragraph contains no indication that it applies only to signalized crossings. The guidance appears to be valid for both signalized and unsignalized intersections. As such, the text should be revised to say, “(see Chapter 4I for signalized crossings)” or something similar.
8E.08	NO	YES	N/A	On p. 735 line 29, the text “are typically used” may imply something about placement of pedestrian signals that is not intended or appropriate to Part 8. I suggest rewording to, “Where pedestrian signal heads are used at highway-highway intersections, they communicate that motorists will . . .”
8E.09	NO	YES	N/A	In Fig. 8E-12, the DO NOT ENTER sign is misnumbered as R1-5 instead of R5-1.
9A.01	NO	NO	YES	<p>The support statement on p. 739, lines 15-17, appears to be false and largely irrelevant. I am aware of no state that requires bicyclists to have a drivers' license, for instance. I do not understand why this statement needs to be in the MUTCD or what value it provides. I urge FHWA to delete it.</p> <p>The support statement that starts on the same page, line 21, is very unclear. What does “use or misuse” mean? What “results” are being measured? What does “counterproductive” mean? This sentence should be deleted because it does not appear to add value. The previous sentence appears to express the point of the paragraph clearly.</p>

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9A.02	NO	YES	N/A	<p>I do not understand the need for the option statement proposed to be added on p. 741, lines 3-4. It seems that sign sizes are adequately conveyed in the tables, and it is unusual to include specific sizes in the text, because readers of the MUTCD may not be aware that they need to look in the text for this supplementary information. If this information needs to be in the MUTCD, it should be added to the tables.</p> <p>Also, this option statement is the only provision in Sec. 9A.02 that uses the text “bicyclists and pedestrians.” The lack of consistency in the language has the potential to cause confusion. What if a sign is applicable to equestrians? Roller-skaters?</p>
9B.02	NO	YES	N/A	<p>The support statement on p. 743, lines 33-34, is unnecessary and not helpful because of its vagueness. The intent of the support statement is clearly implied by the guidance in the following paragraph. I suggest that it be deleted.</p> <p>On p. 744, line 5, “to which” should be deleted.</p>
9B.03	NO	YES	N/A	<p>P. 744, lines 35-36, refers to “lanes shared between motor vehicles and bicycles.” Almost all lanes are “shared between motor vehicles and bicycles” because bicycles are permitted to use almost every lane of every road. It does not appear that the intent of this standard is to exclude from the sign lanes in which both bicycles and motor vehicles are legally permitted to travel. I agree with the proposed text that it is not appropriate to show the shared-lane marking or otherwise include any bicycle-related content on the sign for such lanes. It appears that the standard would be clearer if everything prior to “the” on line 35 were deleted.</p> <p>On the same page, lines 40-41, I suggest deleting “in an attempt to be consistent with . . .” because I believe the intent is to prohibit green on these signs for any reason, not just if the reason is an attempt to be consistent.</p>
9B.10	NO	YES	N/A	<p>Fig. 9B-3 does not show signs, which is contrary to the reference to this figure on p. 746, lines 30-31.</p> <p>The wording of the option statement on p. 746, lines 24-25, is clumsy. It should be reworded to read something like, “. . . where motor vehicle parking maneuvers are required to be angled back-in.”</p>
9B.11	NO	YES	N/A	<p>The guidance on p. 747, line 9, is not necessary. It is obvious that the sign should be positioned near the issue it communicates. Similar guidance could be provided about every sign in the MUTCD. The phrase “in the vicinity” is too vague to allow this guidance to have any value for practitioners related to this particular sign.</p>
9B.17	NO	YES	N/A	<p>On p. 748, line 44, I suggest deleting the text, “if an Exit Gore sign is used”. This could communicate to readers that exit gore signs are optional, when in fact they are required by a standard statement in Sec. 2E.26. This paragraph clearly communicates the point about the No Bicycling sign without this text.</p>
9B.18	NO	NO	NO	<p>P. 749, lines 17-18, refers to a “Two-Stage Bicycle Turn Box Regulatory sign series” with a reference to Fig. 9B-6. However, neither the text of Sec. 9B.18 nor Fig. 9B-6 describes exactly which signs are included in the “Two-Stage Bicycle Turn Box Regulatory sign series”. Fig. 9B-6 shows many regulatory signs, but it does not appear to be possible that all of them are required by the standard on lines 17-18, because two of the signs are NO LEFT TURN (R3-2) signs, and the use of these signs where left turns by motor vehicles</p>

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				<p>are permitted would be confusing. The text of Sec. 9B.18 should clarify which signs are in the series.</p> <p>This is particularly important because the use of the “series” is required by the standard statement on lines 17-18. If practitioners do not know what signs are included in the series, it is unlikely that uniformity will be achieved.</p> <p>Fig. 9B-6 should indicate which signs are required and which signs are optional or depend on circumstances. For example, I find no text that indicates that the NO TURN ON RED signs are required, but a reader may not get this impression from the figure.</p>
9B.20	NO	YES	N/A	<p>The guidance on p. 750, lines 23-24, is not necessary. It is obvious that the signs should be positioned near the issue it communicates. Similar guidance could be provided about every sign in the MUTCD. The phrase “in the vicinity” is too vague to allow this guidance to have any value for practitioners related to this particular sign.</p>
9B.25	NO	YES	N/A	<p>This section appears to be in the wrong chapter. It is proposed to be in Chapter 9B, which deals with regulatory signs. I suggest moving it to Chapter 9D.</p> <p>On p. 751, lines 26, I suggest allowing reduced-size general service signs when they are intended for use by “pathway and sidewalk users,” which is common language in Part 8, rather than just for the “exclusive use of bicycles”. (If FHWA chooses not to accept this comment, then “bicycles” should be changed to “bicyclists.”)</p>
9C.06	NO	NO	YES	<p>I disagree with the guidance on p. 753, lines 36-38. The reason for this guidance statement is unclear. If a bikeway crosses several streets and a plaque is needed at one such crossing, this guidance statement appears to recommend that plaques not be used at the other crossings, even before an engineering evaluation has been undertaken. Practitioners are easily able to determine the best approach for their own agencies based on individual site characteristics.</p> <p>If FHWA chooses not to accept this comment, then at least I suggest deleting the word “would” on line 37.</p>
9C.09	NO	YES	N/A	<p>P. 754, line 30, refers to “the traveled way of a shared-use path”. According to the definition of “traveled way” in Sec. 1C.02, p. 31, lines 25-26, the term is a subset of “roadway” and is not applicable to shared-use paths.</p>
9D.03	NO	NO	NO	<p>The pavement markings shown in Fig. 9D-3 do not comply with the recommendation in Sec. 9E.02, p. 769, lines 10-11, to use dotted lines for the bike lane on approaches to intersections.</p>
9D.09	NO	YES	N/A	<p>The word “acquire” on p. 763, line 3, is incorrect in the context of bicycle sharing. The correct word is “use.”</p>
9D.11	NO	YES	N/A	<p>The term “traveled way” is not appropriate on p. 764, line 6, because this option statement refers to pathways, and traveled ways can only exist on roadways, according to the definition in Sec. 1C.02, p. 31, lines 25-26.</p>
9D.12	NO	YES	N/A	<p>On p. 764, line 29, the word “other” is incorrect because D11 series signs are neither regulatory nor warning. The sentence would technically be correct if the word “other” were deleted, but then the two clauses in the sentence would be redundant. I suggest ending the sentence after “assemblies” and deleting the rest of the sentence, unless there is some other key issue it intends to communicate.</p>

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				<p>On p. 765, line 24, and p. 766, line 10, the word “roadway” should be “highway”.</p> <p>I suggest qualifying the option statement on p. 766, lines 19-20, to clarify that it applies only to signs that are not also visible by drivers of motor vehicles on a roadway. As written, such signs appear to be permitted for shared-use paths immediately adjacent to roadways, which does not fulfill the spirit of the standard.</p>
9D.13	NO	YES	N/A	<p>Fig. 9D-7 shows use of NO TURN ON RED signs, but such signs do not appear to be required by the proposed MUTCD text. I suggest removing these signs from the figure or noting them as optional.</p>
9E.01	NO	NO	YES	<p>I suggest deleting the option statement on p. 767, line 15, and instead inserting “BIKE LANE” preceding “word markings” on line 12.</p> <p>I disagree with the proposed removal of the helmeted bicyclist as a means of marking bike lanes. The provisions for bike lane markings in the MUTCD seem to change frequently, at least by the standards of traffic control devices. Many agencies have removed diamond markings from bike lanes only recently and replaced them with the helmeted cyclist. The vast majority of agencies where I have worked as an employee and traffic engineering consultant use the helmeted bicyclist as their preferred means of designating bike lanes, so changing the designation would cause agencies to undergo yet another transition in bike lane markings. These frequent transitions in markings may communicate to the public that agencies are frivolously changing the markings in such a way that is not the best use of public funds. The transition also introduces public questions about the differences between bike lane marking methods, because agencies inevitably require many years, perhaps a decade or more, to fully repave and restripe all affected streets. By contrast, the size and shape of, say, pavement marking arrows for motor vehicle travel lanes, have remained constant for many decades, contributing to clear motorist understanding and respect. Even if FHWA believes the helmeted cyclist is not the ideal method for marking bike lanes, I urge FHWA to allow agencies to continue to use this marking in the interest of maintaining uniformity and avoiding the problems caused by a transition period.</p> <p>In Fig. 9E-1, the arrow markings should be designated as optional, to be consistent with text on p. 767, lines 25-26.</p> <p>I suggest reverting p. 767, lines 21-23 back to the wording in the 2009 MUTCD rather than substituting the proposed NPA text. The word “first” is unnecessary and causes questions. The use of the singular word “symbol” is confusing. The 2009 MUTCD language was clearer, more accurate, and more concise.</p> <p>On p. 767, line 28, it appears the format of the words “used” and “located” are reversed. The word “located” is what appears to be proposed in the NPA text, even though it is shown with strikethrough. I support the replacement of “used” with “located.”</p> <p>The term “travel way” is used on p. 767, line 35. “Travel way” is not defined in the MUTCD, so its intended meaning is not known. It does not appear to be possible that FHWA intended this to say “traveled way” because it is impossible to designate a traveled way as a shoulder based on the definitions of these two terms in Sec.</p>

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				<p>1C.02. It would be clearer to revise this standard to read, “Shoulders shall not be designated as bike lanes.”</p> <p>On p. 767, lines 37-40, the first part of the support statement, ending at “maneuvers,” can be deleted. The purpose of this support statement is to refer readers to Sec. 9B.15, and the reference to this section is valid and valuable whether or not the condition in the first part of the sentence is met. A reference to another MUTCD section generally does not need to be expressed in a conditional sentence. Also, I do not understand the purpose of the word “or” on line 37, and reference to “a highway user” is very strange because apparently agencies only have to ask the opinions of one “highway user”.</p> <p>The note in Fig. 9E-2 indicates that the bike lane line should be dotted for 50 to 200 feet if “bus stop or heavy right-turn volume.” However, Sec. 9E.02, p. 769, lines 10-11 indicates that the line should be dotted where a conflicting turn exists regardless of the volume. I suggest deleting this note from the figure.</p>
9E.02	NO	YES	N/A	<p>On p. 768, lines 39-41, the proposed additions of parenthetical “(left)” and “(right)” are not adequate to convey the intended guidance. When the left lane is dropped to become a left-turn only lane, but the bike lane is on the right side of the roadway, as is usually the case, there is no need to interrupt the bike lane markings, although this would seem to be recommended by the wording of this paragraph. If it is important to communicate the case of a bike lane on the left side of a one-way roadway, then I suggest writing a new paragraph rather than attempting to make one paragraph apply to disparate cases.</p> <p>The standard on p. 768, lines 46-48, requires certain bike lanes to be marked “with at least one bicycle symbol,” although the general marking requirements for bike lanes in Sec. 9E.01, p. 767, lines 11-12, require either “bicycle lane symbol or word markings”. Is there something about the case described on lines 46-48 that causes word markings to be disallowed in favor of only symbols? This seems to be contrary to the goal of uniformity, although I believe BIKE LANE word markings are used extremely infrequently.</p> <p>The markings shown in Fig. 9E-3 (sheet 3) do not comply with the standard discussed in the preceding paragraph because they are word markings and not symbol markings. The markings also do not comply with Sec. 9E.02, p. 769, lines 46-48, because the standard requires “at least one arrow pavement marking” and arrows are not shown in the bike lanes in all the relevant locations.</p> <p>On p. 769, lines 4-5, I support the option to use shared-lane markings in this case. However, I suggest deleting “through the turn lane” because the best place for the shared-lane markings might not be the turn lane. This is particularly true if the turn lane is a left-turn lane. However, even when the turn lane is for right turns, laws in some states may not permit through bicyclists to use turn lanes, and the presence of a shared-lane marking in the turn lane could introduce a conflict with state law and lead to ambiguity about the safe and legal bicycle lane position. Agencies should have the flexibility to determine the best position for the shared-lane marking based on their practices and individual site characteristics.</p>

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				<p>On p. 769, lines 10-11, I support the guidance to use a dotted line on approaches to intersections. However, I believe the text of the MUTCD should include guidance about the distance the dotted line should be applied, even if expressed as a range of, say, 50 to 200 feet. Many practitioners are not familiar with typical bike lane marking applications, and if the MUTCD does not provide a distance, some designers may choose unreasonably short or long lengths for the dotted line.</p> <p>I disagree with the standard proposed to be added on p. 769, lines 41-42. This standard does not appear to be correct. Drawing A of Fig. 9E-5 does not show yield markings as apparently required by this standard, and I would not expect that such markings should be required in this case.</p>
9E.04	NO	YES	N/A	I suggest deleting the word “rotated” on p. 771, line 2.
9E.05	NO	YES	N/A	On p. 771, line 17, the word “circular” should be “circulatory.”
9E.06	NO	NO	YES	<p>I disagree with the standard proposed on p. 771, line 30, for marking buffers. It conveys that a solid white line along both edges of the buffer space means that crossing the buffer is prohibited. This is not consistent with general pavement marking principles, which require a double-white line to communicate a prohibition. For instance, Fig. 3E-2 (sheet 1), drawing B, shows this same exact buffer marking pattern for preferential lanes, but indicates that this pattern of markings is intended to “DISCOURAGE”, not prohibit, movements across the buffer. Drawing A of the same figure illustrates that a double-white line is needed on each side of a buffer to indicate a case where crossing the buffer is “PROHIBITED”.</p> <p>It is highly contrary to the goal of pavement marking uniformity for the exact same pavement markings to mean one thing in the context of preferential lanes and another thing entirely in the context of buffered bike lanes.</p> <p>Frankly, it is virtually never appropriate to “prohibit” movements across the bike lane buffer area. The distinction is not relevant so much for motor vehicle traffic, which rarely needs to enter the buffer area, but it is a critical distinction for bicycle traffic. Bicyclists may need and want to enter and exit the buffered bike lane to approach and depart from side streets or driveways on the opposite side of the street. As written, these bicycle movements would be considered prohibited, and it would force legal bicyclists to remain outside the buffered bike lane until the next gap, which is contrary to bicyclist comfort and safety. It is highly desirable to encourage cyclists to cross the buffer immediately to access the buffered bike lane. Under the proposed wording, cyclists are at risk of being cited for illegally crossing the buffer to enter or exit the buffered bike lane.</p> <p>The same issue applies to drawing B of Fig. 9E-6. Do the gaps in the markings on the left side of the buffer indicate that parallel parking maneuvers are only permitted to cross the buffer when there is a gap? It is not reasonable for parallel-parking drivers to concern themselves with the locations of the gaps in the pavement markings while positioning themselves for a parking maneuver.</p> <p>It may be possible to address this issue by changing the word “prohibited” on p. 771, line 30, to “discouraged”.</p> <p>The text on p. 771, lines 42-47, is not needed and should be deleted. It repeats verbatim text from Sec. 9E.02, p. 768, lines 28-</p>

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				33. The text from Sec. 9E.02 applies to “bicycle lanes”, not just “conventional bicycle lanes” or “un-buffered bicycle lanes,” so these provisions also apply to the buffered bike lanes discussed in Sec. 9E.06. Furthermore, by repeating this text in Sec. 9E.06 but not other provisions from Sec. 9E.02, it implies that other provisions in Sec. 9E.02 do not apply to buffered bike lanes, which is incorrect.
9E.07	NO	YES	N/A	<p>Throughout Sec. 9E.07, the terms “general travel lane” and “general purpose lane” are used seemingly interchangeably. “General purpose lane” is proposed to be a defined term in the MUTCD in Sec. 1C.02, p. 20, lines 32-36. However, the context of Sec. 9E.07 suggests that this definition is not what is intended, because presumably Sec. 9E.07 applies even when the bike lane is physically separated from a lane open only to, say, buses. The term “general travel lane” is not defined in the MUTCD. I suggest that the NPA use a consistent terminology to refer to the lane adjacent to a separated bike lane. Perhaps this term could be “traffic lane”. The term “traffic lane” implies that the lane is open to motor vehicles, although the word “traffic” is defined in Sec. 1C.02, p. 31, lines 1-3, to include many modes.</p> <p>On p. 772, line 34, and p. 773, line 36, I suggest not using the word “median,” which is defined in Sec. 1C.02, p. 22, line 54, as separating opposing travel directions. Perhaps “raised separator” or “raised island” should be considered instead.</p> <p>On p. 772, lines 4, 6, and 17, the word “center” is not necessary.</p> <p>In Fig. 9E-7 (sheet 1), Drawings A, B, and C all show edge lines on the outside edges of the bike lanes. This is not a conventional pavement marking treatment. The vast majority of agencies do not typically use edge lines on the curb side of bike lanes. Omitting edge lines here is expressly permitted in the MUTCD in Sec. 3B.10, p. 349, lines 11-12. I suggest omitting the edge lines from the curb side of the bike lanes from all the drawings in this figure. However, if FHWA chooses not to incorporate this comment, I suggest that the outside-edge lines be designated on the figure as optional, to be consistent with Sec. 3B.10.</p> <p>Likewise, sheets 1, 2, and 3 of Fig. 9E-7 all show edge lines on the curb sides of roadways. Independent of the presence of bike lanes, agencies almost never mark edge lines against curbs. This practice is also sanctioned by Sec. 3B.10, p. 349, lines 9-10. I suggest omitting the edge lines on the curb sides of the drawings, or, if kept, indicated as optional. However, if FHWA chooses not to incorporate this comment, the left-side edge lines need to be yellow instead of white on drawing B of sheet 1 and drawings D and E of sheet 2.</p> <p>Fig. 9E-7 (sheet 3) shows a tapered line to demarcate the start of the parallel parking area on the right side of the figure. The use of a tapered line can be confusing to motorists and parking enforcement officers because the exact start point of the permissible parking zone is ambiguous. The start of the parallel parking area is better communicated with a line perpendicular to the roadway, as shown in sheets 1 and 2 of this figure.</p>
9E.10	NO	YES	N/A	On p. 776, line 17, the word “circular” should be “circulatory.”
9E.11	NO	YES	N/A	On p. 777, line 3, I suggest deleting the word “passive.” Passive detection is exclusively used in the MUTCD to apply to detection of pedestrians, not bicycles.

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				On p. 777, line 10, the word “orientate” should be “orient.”
9E.12	NO	YES	N/A	<p>On p. 777, line 29, the word “intersections” should be “approaches” according to the context.</p> <p>On p. 778, line 4, the word “lane” should be “approaches.”</p> <p>The language on p. 778, lines 6-9, is not appropriate. As written, the paragraph applies “where it is demonstrated that bicycles arrive” at or near the end of the red. Presumably the use of the plural “bicycles” means that this condition is satisfied if at least two bicycles are “demonstrated” to “arrive”. I’ll save MUTCD users the trouble of doing this bicyclist count: There are, or will be, at least two bicyclists that arrive at or near the end of the red, at some point, at every intersection in the world. It is not necessary or reasonable to require MUTCD users to go out to every intersection with a bike box and observe bicyclist arrival patterns. I urge FHWA to omit the condition in the guidance on lines 6-9 and instead just require countdown signals in all cases where bike boxes are used. This is not an undue imposition on agencies because the use of countdown signals is already widespread, particularly in urban areas where bike boxes are likely to be most common.</p>
9E.13	NO	NO	YES	<p>I disagree with the standard proposed on p. 778, line 40, that would require crosswalk markings where all shared-use paths cross roadways. There are many cases where such markings are appropriate and reasonable, but there are also many cases where such markings are unnecessary and wasteful. My main concern relates to shared-use paths that are parallel and adjacent to roadways.</p> <p>It is not always clear in the field what constitutes the difference (if any) between a “shared use path” and a “sidewalk.” In some metropolitan areas, it is common for “shared-use paths” to be constructed on one side of major streets and “sidewalks” to be constructed on the opposite side. In the field, the distinctions between these two treatments are often width and pavement surface: shared-use paths are often wider and made of asphalt, while sidewalks are often concrete. However, the definitions of “shared use path” and “sidewalk” in Sec. 1C.02, p. 28, make no mention of either width or surface material. Both shared-use paths and sidewalks are open to both bicyclists and pedestrians, and a traveler’s decision about which side of the street to use often has less to do with the traveler’s mode than the locations of his or her origin and destination. It is not always possible to look at a particular active transportation facility and objectively determine whether it is a “shared-use path” or a “sidewalk”.</p> <p>Notwithstanding this definition issue, where an agency designates a shared-use path along one side of a street and a sidewalk on the opposite side, and where bicyclist and pedestrian volume are similar on both sides, it is not reasonable that stop-controlled intersections on the shared-use path side of the street are required to have marked crosswalks, but the intersections on the sidewalk side of the street are not.</p> <p>Major streets often traverse dozens of local street intersections per mile, each of which frequently have very low volume, and which are stop-controlled. Depending on conditions, these intersections may not even be marked with stop lines on the minor street approaches,</p>

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				<p>let alone crosswalks. At intersections, legal crosswalks exist whether or not crosswalk markings are provided, so it is not a legal requirement that agencies mark crosswalks across these very low-volume streets. The proposed standard would substantially increase the burden on agencies to identify these hundreds of crossing locations and fund installation and maintenance of crosswalk markings.</p> <p>This standard would also create a huge liability problem for agencies, because in the aftermath of crashes, plaintiffs would likely argue that sidewalks are actually “shared use paths” and agencies could be held liable for failing to install intersection crosswalk markings where sidewalks cross streets.</p> <p>Crosswalk markings also may discourage side-street motorists from using the best stopping position to find a gap to enter the major street traffic stream. Side-street motorists may be reluctant to stop their vehicles in a crosswalk to observe approaching traffic, but this is often the best place to wait to maximize sight distance.</p> <p>I considered whether to suggest limiting this standard so it only applies to crossings away from intersections. I would be supportive of this limitation, but this would be redundant with a standard proposed in Sec. 3C.01, p. 368, line 4, so if this limitation is added, the entire standard could be safely deleted.</p> <p>If, despite my vehement appeal, FHWA elects to retain this standard, I ask that it be modified to apply only to paved roadways.</p>
9E.13	NO	YES	N/A	<p>In Fig. 9E-14, I suggest that edge lines not be shown on the shared-us path. This is unconventional and could imply a recommendation or requirement for their use.</p> <p>In the same figure, the type of traffic control is not shown, which is fine. However, the figure shows stop lines on the roadway, and the best practice for use of stop lines in this situation is to install them much farther upstream of the crossing, such as required by the standard in Sec. 2B.19, p. 73, lines 14-16. I suggest repositioning the stop lines to better illustrate desirable practice.</p>
9E.14	NO	YES	N/A	<p>The standard on p. 779, lines 8-10, needs to specify that it is referring to bicycle route pavement markings, because out of context this sentence causes many unintended problems with pavement route markings for lanes open to motor vehicles.</p> <p>It would also be best for consistency to refer to them as “bicycle route pavement markings”, as in the title of this section, rather than changing the nomenclature to “pavement marking route markers”, which is somewhat redundant, as in this standard, or “route marker pavement marking” later in this section. Making this change may address the concern in the previous paragraph.</p> <p>P. 779, line 17, indicates that the marking “should not be elongated.” Elongated relative to what? The meaning of this guidance statement is unclear because Fig. 9E-15 clearly shows the pavement marking elongated with respect to the sign.</p> <p>The text “be considered that will” should be deleted from p. 779, line 18.</p>
9E.15	NO	YES	N/A	<p>The word markings WAIT HERE FOR GREEN in Fig. 9E-16 need to be noted as optional, to be consistent with the option on p. 779,</p>

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				<p>lines 25-26. As shown, the figure implies that the word markings are an integral part of the marking and a reader would not know they can be omitted.</p> <p>The word markings WAIT HERE FOR GREEN do not read “in the direction of travel” as recommended for pavement word markings in Sec. 3B.21, p. 360, lines 24-25.</p>
9E.16	NO	YES	N/A	<p>The figure reference on p. 779, line 35, should refer to drawing A of the figure, and the reference on line 39 should refer to drawing B.</p> <p>In drawing A of Fig. 9E-17, it is not clear why the taper length is shown uniformly as 5', regardless of the width of the obstruction or the design speed. The 5' taper length does not comply with the notes at the bottom of Fig. 9E-17 for a typical bicycle design speed of 20 mph and a 1-foot recommended offset for the obstruction, let alone the width of the obstruction itself. I suggest labeling the taper dimension “L” so readers know they need to apply the formula at the bottom of the figure to determine the correct length.</p> <p>In the same drawing, I suggest modifying the centerline on the path to show a solid line instead of a broken line for a distance in advance of the obstruction to alert path users that they should not begin passing maneuvers immediately upstream of the obstruction.</p>
9E.17	NO	YES	N/A	<p>On p. 780, lines 21-22, the proposed standard as written appears to permit green devices as long as their purpose is not “to supplement the presence of green colored pavement”. I suggest striking this last phrase so green devices are prohibited in all cases, regardless of the designer's purpose.</p>

TABLE 2. AGREE WITH ANOTHER COMMENTER. If you agree with another commenter, please indicate the commenter with whom you agree with and note any additional information FHWA may find helpful or any exceptions.

Docket Comment Number and/or Commenter Name	Agree with commenter's comments as written	Agree with commenter; with exception(s)	Additional information helpful to FHWA, or exceptions to commenter's comments