

NPA Item	Section	Draft Docket Comment
5	1A.03	The current manual is the result of a series of iterative updates of the MUTCD which dates back to the 1948 and 1961 editions. These were created during a time period when maximizing vehicle capacity and minimizing motorists delay was a national priority. The manual was also developed under a premise that strict uniformity of the design and application of traffic control devices will result in a safer roadway environment. The evidence for this is weak and not supported by research or experience. The safety experience of the US roadway system continues to lag behind G20 Peer nations. Pedestrian and bicyclist safety in particular have not been prioritized over the last 50 years sufficiently. Since the early 1970s, pedestrians and bicyclists have consistently accounted for 15 - 20% of all fatalities on the road system, yet they are not given a priority status in updates to the MUTCD to address this disparity. Examples of this bias exist in speed limit policy (where motorists are given the greatest weight in establishing the speed through their behavior) and signal warrants which are established not to assess safety risk, but to minimize motorist delay based on minimum volume justifications that ignore the context that many roadways are too dangerous to cross for pedestrian volumes to be high. Those warrants are entirely reactive to pedestrian risk taking which results in warrants based on their injuries and deaths occurring, instead of being easily predictable. The Zegeer research on Crosswalks is currently used to deny the installation of marked crosswalks in urban areas, instead of being used to warrant safety upgrades. This is completely backwards from a safe systems approach. FHWA should rewrite the MUTCD from a safe systems framework to minimize deaths and serious injuries on the road system. https://www.vox.com/the-big-idea/2016/11/30/13784520/roads-deaths-increase-safety-traffic-us
5	1A.03	The goal of roadway design should be the safety of all roadway users. Phrases like "reasonable and prudent" and "alert and attentive" are subjective and therefore open to interpretation based on our human biases and preferences. Vision Zero principals and a Safe Systems approach incorporate the idea that humans are fallible and the design of traffic control devices, and roadways, should allow for this. At the end of the day, safety should be prioritized over "optimization" of traffic control devices, which all too often means the "optimization" of motor vehicle speeds. Remove the entire proposed Section 1A.03 as it works against these goals and provides an opportunity for bias.
8	1A.06	The UVC has not been updated in a long time, is growing outdated, and is not a readily accessible document; Vision Zero principals and a Safe Systems approach are not present in the UVC. The NCUTCD has been unable to create any movement on addressing updates to the UVC. The members of the NCUTCD are primarily transportation professionals without legal training. It would be more appropriate for the UVC to be updated and maintained by another organization of legal professionals who have the professional qualifications and experience to maintain a model UVC. The members of the NCUTCD do not have the proper expertise to practice law. https://www.uniformlaws.org/home .
8	1D.03	Changes are proposed to new Section 1D.03 by relocating text from existing Section 1A.02 and 1A.06. This comment is made here because there does not appear to be a NPA number associated with the new 1D.03. The concept of "uniformity" is too narrow and ignores the important consideration of context. Uniformity needs to expand include contextual conditions of low-speed urban streets vs high-speed highways. "Uniformity of the meaning of traffic control devices is vital to their effectiveness. Uniformity means treating similar situations in a similar way." The bias of the manual against people walking shows up in how the manual treats crosswalks. Unmarked crosswalks are not recognized as being a real thing to the public. Marked crosswalks are shown to improve understanding of intent. There is no uniformity to how marked crosswalks are provided in the manual and the existing language of the manual is used frequently to discourage the installation of pedestrian safety measures. There is no uniformity to the provision of pedestrian accommodations for pedestrians at traffic signals. Research proves that the provision of pedestrian signals are key to improving safety, yet the proposed guidance allows pedestrian signals to not be installed at signalized intersections. There is no uniformity for how to provide safe pedestrian crossings. This is most apparent at school crossings. The Zegeer research is clear in showing that higher volume, higher speed roadways present safety dangers to pedestrians and recommends the installation of hybrid beacons and signals to aid in crossing, yet the existing warrants for those same safety devices requires minimum volumes to justify their installation. The existing condition is dangerous, thus the warrants are designed to require the death and injury of people to attempt to cross the street before the device is "warranted." The warrants allow engineering judgment to override these elements, but the reality is the vast majority of agencies strictly adhere to the warrants and rely upon existing counts to meet the warrants ignoring the underlying reality the existing conditions suppress pedestrian activity. We have a pedestrian safety crisis that is not being addressed, yet meanwhile, an entire chapter of the manual has been added for CAVs to ensure they can safely operate on the roadways.
10	1B.02	It is common and necessary to create standards, policies, and guidance regarding traffic control devices that have interim approvals. As an example, RRFBS necessitate all of these documents but RRFBS have an interim approval status. This proposed Guidance statement is in conflict with normal and necessary practice by agencies. Remove the Guidance statement on lines 9-12 on page 7 (Clean Version).
13	1B.06	The experimentation process is essential to collecting data on emerging technologies and best practices for traffic control devices. The proposed language places additional burdens on agencies wishing to conduct experiments, which will practically result in fewer experiments; it is already difficult for agencies to conduct experimentations, and additional requirements and restrictions will not alleviate this situation. Modify the requirements to make several key changes: allow roadway owners to add themselves to existing experiments, develop a short, practical guide to experimentation, develop a simple experimental data collection best practice document, and clarify the process for permitting a second stage of testing for new traffic control devices. Further, FHWA needs to work to align NCHRP studies and UTC research to meet requests for experimentation requirements, rather than require cities to entirely self-fund this research. Funding needs to be aligned with the proportion of fatalities and serious injuries on roadways, to support meaningful change in outcomes.
17	1C.02	Add a definition of separated bicycle lane to the Manual: "A bicycle lane that is physically separated from motor vehicle traffic. Physical separation consists of vertical elements which include, but are not limited to channelizing devices, parked vehicles, or raised islands."
17	1C.02	Revise the definition of a shoulder to explicitly mention that travel by bicycle or pedestrian may be allowed, and may in fact be the only place for pedestrians to walk, as is common throughout USA where pedestrian infrastructure has not been provided.

40	2A.19	The manual strengthens recommendations to avoid an "excessive use of signs" at the same time the draft language proposes the following: 1) Proposed new R10-12b turning traffic yield to bikes sign will be installed almost all the time at locations which also will benefit from an R10-15a sign. This will result in a doubling of signs at an intersection. The R10-15a should have an option to allow use of the pedestrian and bike signal to avoid "an excessive use of signs". The addition of an unresearched R10-12b sign violates this MUTCD principal. 2) The requirement that a yield sign be used at all locations where a supplemental yield condition is desired on bikeways is also an extra and unnecessary sign requirement. The proposed manual should delete the R10-12b and allow the bike symbol to be used on the R10-15a sign to minimize sign clutter. Yield signs should not be required with supplemental yield markings used on bike bikeways or to denote a yield condition for motorists after they have turned left into a pedestrian crossing or after the motorists has departed from a stop sign, but must still yield at the edge of a travel lane which may occur at locations with separated bike lanes and sidepaths.
55	2B.09	Add an option for using a bicycle symbol, or a pedestrian and bicycle symbol on the R1-5 sign. These signs can be commonly used ahead of crossing locations that are predominately made by bicyclists, or by bicyclists and pedestrians, such as shared use paths. This reason is similar to the R1-6 and R1-9 signs, which are proposed to have a version with the bicycle and pedestrian symbol. Safety research shows the use of gateway treatments is really strong. To minimize the excessive use of signs, the ability to put a bike symbol on the R1-6 and R1-5 signs is important for all locations where shared use paths operate and separated bike lanes are adjacent to sidewalks. this is actually more "uniform" with the application of a W11-15 sign at a shared use path crossing. It makes no sense to create another series of bicycle only R1-5 signs to supplement pedestrian versions.
66	2B.20	Extensive research has been conducted on the R1-6 sign by Western Michigan University. This research indicated that yielding behavior improved most significantly when the signs were applied in a gateway configuration. The proposed changes to the Standards removes the option for locating a sign in a gateway configuration by placing it on the outside of the lane. Revise the Standard to follow the research that was completed. Additionally, remove the proposed Standard requiring the W11-2 or W11-15 sign be used with the R1-6 sign; the gateway configuration of the R1-6 increased yielding most, and the warning signs will add unnecessary sign clutter. It is important for FHWA to follow published research on proven safety treatments, not least of all because we have a pedestrian safety crisis in this country. If FHWA believes there is research supporting the proposed changes that contradicts the research conducted by Western Michigan University on this topic, it should be shared to justify the direction proposed. Further, state laws in most states give bicyclists the same rights as pedestrians in crosswalks.
67	2B.21	The 85th Percentile should have no bearing on speed limit setting policy outside of limited access freeway environments; agencies should have the goal of minimizing injury clearly above any other goal, and Vision Zero principals and a Safe Systems approach should be used to determine the speed limit. One good example of an approach to minimizing injury through speed setting is used by Washington State DOT; the approach is: 1) establish target speeds, 2) use default/category target speeds, 3) where the operating speed is within 5mph of the target speed adopt the target speed, 4) where the operating speed exceeds the target speed by 5mph, use an engineering study to determine iterative speed limits and implement speed management, 5) make incremental adjustments of 5mph or more, as motorist response to speed management until the target speed is achieved. The Washington State Injury Minimization and Speed Management Policy Elements and Implementation Recommendations is located here: https://wsdot.wa.gov/travel/commute-choices/walk/pedestrian-safety. The use of 85th Percentile speed for limited access freeway environments may be appropriate, and splitting the two environments into two distinct categories should be accomplished in this section.
98	9B.20	The presence of a RRFB does not change the assignment of right-of-way at a marked crosswalk, which should follow state law. The proposed addition of "await gap in traffic" is not consistent with all state law and should be removed from the sign. It is confusing what evidence is being used to justify this proposed change. Can FHWA demonstrate that there is specific concern as to why uncontrolled crossings with RRFBs should be treated differently than uncontrolled crossings without them? It appears that this proposed change will be used to blame vulnerable roadway users when they are a victim of a crash; FHWA should be prioritize changes that address the epidemic of vulnerable roadway user serious injury and death in this country.
99	2B.60	FHWA has proposed adding a new sign, the R10-12b, rather than provide a modification to a commonly used, well researched, and easy to understand existing sign, the R10-15, to alert left turning motorists to the presence of bicyclists. When there is an option to provide modifications to existing signs to better alert road users to the right-of-way responsibilities, the modification should be favored over the creation of a new sign unless extensive supporting evidence is provided showing how the new sign significantly improves comprehension, yielding, or other desired affect. If supporting evidence does not exist, remove this new sign and provide the modification to the R10-15, with the option to add the bicycle symbol, or add the bicycle and pedestrian symbol, as this clearly identifies the right-of-way responsibilities for roadway users and is widely used today. Additionally, when bicyclists and pedestrians are present, the use of one sign (rather than a sign for bicyclists and a sign for pedestrians) reduces sign clutter. Secondly, the use of this sign should not be restricted to signalized intersection, but should be allowed in advance of driveways, unsignalized intersections, or other higher conflict locations. Revise the corresponding text to allow the modified R10-15 sign to be used in unsignalized locations.
180	2D.55	Within Section 2D.55 add a reference to Section 9D.12 for bicycle wayfinding. Community wayfinding signs should be coordinated across all modes of travel and decisions made regarding signs intended for motorists also apply to bicyclists on a shared-use path system when considering system wide uniformity, legibility, and consistency.

180	2D.55	We disagree with the proposed change to modify the current Guidance statement about the rectangular shape of a community wayfinding sign to a Standard statement. This change greatly limits the creation of signs that identify the community and this restriction adds unnecessary conformity to signs that should represent the unique qualities, identity, and desires of individual municipalities. Outside of high speed environments, it is not clear that the restriction on the sign shape provides any safety advantage nor is this restriction supported by any research.
336	3B.19	The use of yield markings on separated bike lanes without signs should be an option. Separated bike lanes are frequently built in constrained, urban environments with short blocks. The requirement to place a sign at every yield marking increases sign clutter; with crowded curb space, it can be difficult to find a place for the sign. Given the slow speeds of bicyclists in these environments, the practitioner should have the option to exclude this sign based on engineering judgment. NPA #40 in Section 2A.19 adds additional information regarding avoiding sign clutter, and this comment seems in line with that change. Remove the Standard to have signs accompany yield markings on separated bike lanes, unless there is research that backs up the requirement that this results in better safety outcomes.
336	3B.19	In previous edition of the manual, the R9-6 sign was predominantly used in areas where shared use paths entered congested zones. The way this sign is used in the NPA is nearly the same as how the R1-5 is used for motor vehicles. As such, a version of this sign must address "STOP FOR" states in the same manner as the R1-5a. Figure 9B-4D, when considering a "STOP FOR" state makes it clear why another version is necessary. Add a second version of this sign.
346	3C.01	Similar to the proposed Standard added to Section 9E.13 on shared use path crossings, FHWA has added a new standard requiring all non-intersection crosswalk locations to be marked. This makes sense as non-intersection, midblock crosswalks are not legal unless marked. This is an important step towards shifting the MUTCD towards a safe systems approach as these requirements will result in practioners needing to focus on ensuring these crossings are accessible and that people can actually cross the roads safely. Our position is very similar to the comment on Section 9E.13: while we support marked crosswalks being the default treatment at these locations, we do not understand how FHWA can rationalize requiring marked crosswalks at these locations but not requiring them at signalized intersections or other locations such as school zones, transit stops, parks, and urban areas where pedestrian use should be assumed as a default condition. We do not understand why FHWA STEP guidance, which identifies the need for countermeasures at uncontrolled crossing locations (like marked crosswalks) based on motor vehicle speed, volume, and other characteristics, is not referenced in this location. To address the pedestrian safety crisis it is critical that pedestrian crosswalks with supportive traffic controls applied following a safe systems strategy be used at greater frequency on the road system. Lastly, it is not logical to allow "unmarked crosswalks" to remain a predominant design strategy within the MUTCD while an entire chapter is being added to accommodate the technology needs of autonomous vehicles to recognize the road environment. The bias towards accommodating autonomous vehicles to address the technology shortcomings of the auto industry over the safety needs of pedestrians is a serious shortcoming of this MUTCD that must be corrected.
346	3C.01	Add reference to Section 4L - RRFBs to the paragraph starting on line 26, page 326 (Clean Version).
347	3C.02	FHWA has proposed changes to Section 3C.01 and 9E.13 to require marked crosswalks at non-intersection locations and at shared use path crossings. However, FHWA proposes to leave the Guidance statement in this section, rather than revise to a Standard. It is not clear why these locations should be treated differently. Marked crosswalks at signalized intersections should be the default application and practitioners should have the burden to identify the reason why they aren't appropriate, rather than the other way around. We have a safety epidemic for vulnerable roadway users in this country and making crossings more conspicuous, especially at arterial, collector, and school crossings has the potential to reduce serious injury and death when combined with other comments, such as requiring pedestrian signal heads at all signalized intersections. FHWA has not been consistent in the proposed changes and it is not clear that vulnerable roadway users are at the front of mind.
367	3H.03	FHWA has issued several official interpretations on decorative crosswalks since the last edition of the Manual was published. This issue is a clear example of the agency applying inappropriate highway standards on urban streets and the conflation of safety needs on highways with those in urban areas. This is an example where restrictions on the use of decorative crosswalks can be contextualized to be limited to high speed, non-urban roadways instead of applying a one size fits all restriction. In various instances, FHWA has made subjective statements about the relative safety of these crosswalks without providing supporting evidence. As an example, in Interpretation 3(09)-08 (I) FHWA states that "even though it is non-retroreflective, its use in areas with street lighting means that it will be prominently visible to road users both day and night and it has a significant potential to distract road users and thereby reduce safety." FHWA has not provided any supporting evidence of this claim, so it must be considered as conjecture. The corresponding standards in the proposed Section 3H.03 build on this conjecture. Remove these restrictions until a time where evidence is provided that decorative crosswalks perform worse than other types of crosswalks. Until then, agencies should be afforded engineering judgment and the ability to install community-identifying and desired crosswalks. Urban environments are not the same as highway environments and flexibility should be provided to address context sensitivity. The MUTCD should not be used to dictate all aspects of urban design unless there is a clear relationship to negative safety outcomes. The design of roadway pavements, surface materials, and crosswalks in low speed, urban environments do not need, nor should they be highly regulated. Roads make up a disproportionate amount of the public space in urban areas and have a large impact on the aesthetics of a community. Roads are not for the exclusive use of motorists in urban areas and serve multiple community objectives that must be respected given the 100 year history of FHWA and State DOT discrimination against people of color in urban communities through the destruction of communities by roadway projects. This history should be respected and acknowledged in the MUTCD approach to controlling all aspects of roadway character and deign in these communities. The regulation of rainbow crosswalk and other decorative crosswalks is needlessly punitive and continues the harm of Federal overreach into these communities.

370	3H.06	This proposed text applies exclusively to bicycle facilities; move this text to Part 9 and add a reference here, which reverses the proposed organization. Green pavement color is frequently used as a community-wide system to demonstrate areas where conflicts with bicyclists and other roadway users are expected. The proposed restrictions on where green pavement can be used works against this principal, as it disallows green pavement color in places where bicyclists will commonly be present and similar conflicts are expected. Specifically, we are requesting the following: Since green pavement marking is allowed on any bicycle lane, including on sidewalk-level bicycle lanes that are adjacent to sidewalks, green pavement marking should also be allowed on shared use paths where the bicycle movements are separated from the pedestrian movements. There are many common instances where this would be applicable and there is very little practical difference in operation between these two types of facilities that would warrant restricting the use of green in one but not the other. Remove this restriction from the Standard statement, line 4 on page 347 (Clean Version). Green-backed shared lane markings are currently subject to requests to experiment. The proposed language explicitly disallows this use. FHWA must present data that justifies this restriction. Research shows that using green pavement marking enhances road user awareness to the presence in bicyclists; this is especially useful in contexts where the bicycle movement may be unexpected. Green-backed sharrows add conspicuity to unexpected lateral shifts approaching intersections and should be a treatment allowed with engineering judgment. Remove the restriction on using green pavement marking on separated bicycle lanes on independent alignments. While these alignments may commonly be further away from parallel roadways, there are common and frequent instances where green pavement marking will help clarify the right-of-way and presence of bicyclists to other users in the vicinity. This should remain an option subject to engineering judgment.
380	3J.07	Remove reference to the area between the double line and curb as being outside the street since this negates the appropriate use of detectable warning surfaces. Provide an additional Option C which is similar to Option B but provides a detectable warning surface at the edge of the travel way, requires vertical elements along the edge of the curb extension, and removes the detectable warning surface at the curbline.
384	4A.05	The proposed Section 4A.05 uses the same language to describe the meaning of a steady GREEN BICYCLE and a flashing YELLOW BICYCLE indication; following the understanding and meaning of signal indications for roadway users, these two indications cannot have the exact same meaning. The proposed meaning for both is consistent with the existing meaning of a flashing yellow indication. Remove the word "cautiously" from the meaning of a steady GREEN BICYCLE so that it is consistent with the existing meaning of a steady GREEN indication to motorists. A reason that FHWA may have proposed a meaning that is identical for these two different signal indications presents itself in the proposed text in Section 4H.01, which allows the practitioner to use either indication in situations where permissive turns are permitted across the bicycle facility at signalized intersections. From a consistency standpoint, and building off the existing meaning of green and yellow signal indications, a GREEN BICYCLE and a flashing YELLOW BICYCLE should not mean the same thing and should not be used interchangeably. This violates the "uniformity" principal the FHWA frequently touts in the meaning of traffic control devices throughout the manual. Further, if a flashing YELLOW BICYCLE indication is presented to bicyclists, and a flashing YELLOW ARROW indication is presented to turning motorists, there is some confusion as to who has the right-of-way. Bicyclists should always have the right-of-way in this scenario, so the proposed signal indication setup (flashing YELLOW BIKE and flashing YELLOW ARROW) should be reserved only for situations where the normal right-of-way is not present. The discussion on when to use a flashing YELLOW BICYCLE indication must be expanded upon in Section 4H to clarify its use; additional comments are added to these items. Finally, NCHRP Report 273 researched the current application of bicycle signal indications throughout the country. The paper identified several needs for future research based on current use and agency interviews. One of these research ideas was to "identify guidance on ways to communicate with a person on a bicycle that their movement is protected or permissive and whether it conflicts with other road users." Since this research is not completed, it is appropriate that the proposed changes do not recommend a method for making this distinction; however, FHWA should prioritize funding in this area and make subsequent changes to the Request to Experiment process to enable easier experimentation to accomplish this goal.
384	4A.05	Motor vehicle signal heads do not require an exclusive direction sign; for the same reason, bicycle signal heads should not require exclusive direction signs; there is no research to support the requirement that these signs be used. Further, they add to sign clutter which the MUTCD recommends against. Change the Standard to an Option so these signs can be used based on engineering judgment. Additionally, a Bike Signal sign without the exclusive direction symbols should be added.
386	4B.02	Remove "or operated" in order not misinterpret this guidance as prohibiting some standard practices like setting low platoon speeds or rest in red operations.
388	4B.05	Add "Rectangular Rapid Flashing Beacon (see Chapter 4L)," after reference to pedestrian hybrid beacon.
392	4C.05	The entire section on traffic signals is moving into a better direction with the change of Standards to Guidance under the warrants. This does allow greater flexibility for agencies to determine local priorities. However, the traffic signal warrants were largely established in the 1950s and 60s. They all need to be modified to reflect a safe systems approach to the decision making process. The warrants are all designed with unreasonable thresholds of achieving minimum pedestrian volumes within the context of a transportation system designed to be dangerous. The overriding priority for each signal warrant is the minimization of motorist delay. Safety criteria are not clear and measurable factors in the decision for when to install or how to operate the signals. This is inequitable and harms FHWA and State DOT goals to improve safety and expand multimodal options. Signal warrants as written, are used by agencies and in litigation to focus solely on traffic and pedestrian volumes, not safety. The existing warrants are a major barrier to achieving Vision Zero in the United States.

395	4D.02	FHWA proposes a new Guidance statement stating that pedestrian signal heads should be installed at signalized intersections with marked crosswalks. When you combine this statement with the existing Guidance statement in Section 3C.02 regarding marked crosswalks at these locations, it's clear that FHWA has given practitioners two ways to get out of installing pedestrian signal heads. Practitioners may first decide that a marked crossing is needed, and then may safely disregard this should statement; or, practitioners may decide that the marked crossing doesn't warrant a pedestrian signal. There are very few signalized intersections that have zero pedestrians at them. This is a biased provision that prioritizes the needs of motorists above all others which endangers the most vulnerable. It appears that FHWA is not taking the vulnerable roadway user safety epidemic seriously by putting forward these as Guidance statements. The approach must be exactly reversed. FHWA must mandate that practioners consider marked crosswalks and pedestrian signals by default, with a narrow set of reasoning why they may be excluded (i.e. rural roads, short crossings). FHWA has taken this approach with the proposed changes for uncontrolled crossings away from intersections and shared use path crossings, but must go further and extend these requirements to signalized intersection locations.
417	4H.01	Add additional Option between as follows "To provide a fully separated bicycle signal phase."
417	4H.01	As proposed, practitioners are allowed to use steady GREEN BICYCLE and flashing YELLOW BICYCLE indications in the same scenario, where permissive turns are permitted across a bicycle facility at a signalized intersection. This represents an inconsistent and non-uniform approach to signalization and is counter to the Guidance statement and Support statement proposed on lines 14-20 (Clean Version). As previously stated (see recommended changes on NPA Item #384), the steady GREEN BICYCLE and flashing YELLOW BICYCLE should not have the same meaning and should not be used interchangeably. The Guidance and Support statement may make more sense if the meaning of the two indications is revised and the Option to use them interchangeably is removed. Lastly, as recommended by NCRHP Report #273, research is needed to determine guidance on ways to communicate with a person on a bicycle that their movement is protected or permissive and whether it conflicts with other road users. It is important to recognize that if a well-researched method for communicating this was available, a corridor with both permissive and protected movements would by necessity have some inconsistency in bicycle signal indications, but would be more consistent in communicating the signalized crossing to people on bicycles; considering this, the Guidance and Support statement do not add valuable information to the practitioner and should be removed.
417	4H.01	Add clause at end of proposed Standard starting on Line 26 (Clean Version) "except for option outlined in paragraph 7" referencing Option on line 31-35.
417	4H.01	Modify the Option on line 30 (Clean Version) to allow permissive turns across two-way separated bike lanes based on engineering judgment. This scenario is not meaningfully different than a sidepath which does not have a similar restriction on permissive turns. The decision whether signal phase separation is needed should to be made based on context.
417	4H.01	Differentiate steady GREEN BICYCLE and flashing YELLOW BICYCLE as referenced in comment regarding NPA Item #384; a steady GREEN BICYCLE and a flashing YELLOW BICYCLE should not have the same meaning and should not be used interchangeably. If a flashing YELLOW BICYCLE indication is presented to bicyclists, and a flashing YELLOW ARROW indication is presented to turning motorists, there is some confusion as to who has the right-of-way. Bicyclists should always have the right-of-way in this scenario, so the proposed signal indication setup (flashing YELLOW BIKE and flashing YELLOW ARROW) should be reserved only for situations where the normal right-of-way is not present. The discussion on when to use a flashing YELLOW BICYCLE indication must be expanded upon in Section 4H to clarify its use; additional comments are added to these items. An additional consideration is regarding NCHRP Report 273, which researched the current application of bicycle signal indications throughout the country. The paper identified several needs for future research based on current use and agency interviews. One of these research ideas was to "identify guidance on ways to communicate with a person on a bicycle that their movement is protected or permissive and whether it conflicts with other road users." Since this research is not completed, it is appropriate that the proposed changes do not recommend a method for making this distinction; however, FHWA should prioritize funding in this area and make subsequent changes to the Request to Experiment process to enable easier experimentation to accomplish this goal.
417	4H.02	Remove the proposed Standard in paragraph 3 (Clean Version); practitioners have been using bicycle signals in conjunction with Pedestrian Hybrid Beacons without incident in Phoenix and Tucson. Evidence that this operation is problematic should be provided to support this restriction; otherwise, the use of bicycle signals with PHBs should be based on engineering judgment.
417	4H.03	Remove Section 4H.03; the text is confusing and may be interpreted to mean that a bicycle signal requires a specific warrant in and of itself, which is not the case. Move Guidance and Support for the decision to install bicycle signals to Section 4H.01 "Use of Bicycle Signal Faces". If Section 4H.03 remains, remove "designs or" in order to remove unnecessary ambiguous language regarding signal warrants. This also clarifies that bicycle signals are not an official warrant and do not need an official warrant to install.
417	4H.04	The necessity of a sign accompanying a bicycle signal indication should be left to engineering judgment based on the context. Change the Standard to a Guidance statement. FHWA needs to consider options for practitioners to change the signal backplate to integrate word messages and/or colors to differentiate bicycle signals from motor vehicle signals. The reality is that urban corridors are constrained and more tools are necessary to distinguish the two signals than just a regulatory sign. The bicycle signals in Longbeach, CA are an excellent example of an option that should be made available.

417	4H.06	Mirror Section 4H.05 to how Section 4F.01 combines and lays out "Application of Steady and Flashing Signal Indications "during Steady (Stop-and-Go) Operation" rather than just steady signal indication. The proposed Option in paragraph 4 (Clean Version) to use a flashing YELLOW BICYCLE when permissive turns are permitted across the bicycle lane should be removed. The proposed changes treat the flashing YELLOW BICYCLE and steady GREEN BICYCLE as interchangeable, which is not consistent with the meaning of these signal indication colors. Further, it creates confusion in right-of-way between motorists and bicyclists, as stated in the comment on NPA #384 and #405. The use of a flashing YELLOW BICYCLE should be better reserved for situations when the traffic control signal is operated in flashing mode.
417	4H.12	Line 7-8 (Clean Version) states that the yellow change interval for bicycle signal faces shall be 3 seconds, which is more restrictive than the language provided in 4F.17 for motorists. Change Standard to Guidance and remove text "except that the minimum duration of the yellow change interval shall be 3 seconds."
419	4I.01	Remove the requirement of an engineering study to install APS. If an agency would like to install APS is shouldn't have to complete an engineering study to identify things like "potential demand for accessible signals", "requests for accessible signals" or "traffic volumes during times when pedestrians might be present." Installing APS may be based on a policy goal of installation regardless of the results of these inquiries.
422	4I.04	Remove "or after the end of" in paragraph 6, as a countdown display will not be used during the red clearance interval if the pedestrian phase has already ended.
423	4I.05	Add "Adjacent to push button" after proposed text on line 25, page 420 (Clean Version).
423	4I.05	The push buttons depicted in Figure 4I-3 should be revised such that they are parallel with the crosswalk (not the curb ramp, as currently shown), to be in accordance with the body text.
423	4I.05	Please define the dimensions for the desirable push button areas in Figure 4I-2, or use a single gradient that does away with the 3 different zones altogether.
423	4I.05	Please revise the push button placement defined in 4I.05.G "Between 1.5 and 6 feet from the face of curb...." to afford greater flexibility for various contexts. An example of this that could be used is Minnesota DOT's guidelines of: - 4 feet minimum setback for urban (curbed) installations - 6-8 feet minimum for rural (non-curbed) installations - 9.5 feet maximum setback The DOT has provided a rationale for these dimensions as follows in their "Curb Ramp Guidelines" - https://www.dot.state.mn.us/ada/pdf/curbramp.pdf: "There is a lot of discussion regarding the best setback to use under Criteria #2. Even though the 1.5 ft. setback is preferred by visually impaired users to provide the shortest street crossing distance, placing pedestrian stations too close to the road presents snow and ice operational difficulties and turning movement conflicts. A 4 ft. minimum setback is recommended for snow and ice winging operations. A larger setback is often appropriate depending on the quadrant's design radius and the likelihood that turning trucks will track over the curb section and destroy the push button station. Typically a curb ramp will be longer than 6', requiring a tiered ramp to meet this dimension. Also, push buttons placed close to the roadway are prone to damage either by snow plows or trucks. Snow and ice sidewalk clearing operations are also a factor. ADA requires a 4 ft. minimum PAR distance around the pedestrian stations and ramps but to accommodate sidewalk snow clearing operations a 6 ft. clear minimum width maintenance path is recommended."
423	4I.05	Change 4I.05.D to "Immediately adjacent to a level landing at the top of the curb ramp". A push button placed up to 10' from a curb ramp is not helpful for users with disabilities. A user with a vision disability cannot effectively use a push button to provide a crossing direction cue when the push button is not aligned with the truncated domes. A user in a wheelchair will have difficulty bracing their chair on a grade while pushing the APS button. One example of this placement requirement can be found in the Minnesota DOT's "Curb Ramp Guidelines" - https://www.dot.state.mn.us/ada/pdf/curbramp.pdf, see pages 23-25.
423	4I.05	Please define the reach requirement in 4I.05.A in this document rather than referring to two separate external sources.
426	4J.02	Coordination should be based on context. Change the language to remove bias for coordination.
426	4J.02	Modify Guidance B on line 21 (Clean Version) to state "If installed within a signal system, the pedestrian hybrid beacon may be coordinated." Consistent with new signals, new PHBs should require the installation of APS. Change the proposed Guidance to a Standard.

448	Part 5	Remove the entire proposed Part 5 from the Manual update. It is not appropriate to add statements, even if they are Guidance statements, to the Manual for technology that is in it's infancy. The proposed language has the real possibility of pushing cities to adopt policies catering to CAVs, rather than to push CAVs to develop technology appropriate for vibrant, walkable, urban environments. In place of using Part 5 for CAVs, FHWA should create a Part of the Manual dedicated solely to accommodations of pedestrians on our city streets. As a way of preparing for CAVs, FHWA should focus on standardizing consistent and intuitive access for pedestrians; by doing this, FHWA will simultaneously advance goals of reducing the overrepresentation of fatalities and serious injuries by vulnerable road users. For example, research indicates that people of color and disadvantaged communities have disproportionately higher rates of injuries and deaths within the USA because of inadequate and unsafe transportation infrastructure - for pedestrians specifically the lack of accommodations. Pedestrians also suffer disproportionate risk of injury and death within the system as a whole. Recommendations should be established to strengthen pedestrian safety and prioritize their needs over the needs of the automobile industry and their inadequate technology which is leading to the beginning of a mandate for more and wider roadway markings for travel lanes and a mandate for protected bike lanes. While more markings and protected bike lanes are also helpful, the motivation to prioritize the needs of the automobile industry over the longstanding needs to actually improve safety within the context of an inequitable transportation system must and should be prioritized first. https://usa.streetsblog.org/2017/01/10/the-unequal-toll-of-pedestrian-deaths/ https://escholarship.org/content/qt1m07078c/qt1m07078c_noSplash_deab37c3ba82ad50c05813f08bebc101.pdf https://www.governing.com/archive/gov-pedestrian-deaths-analysis.html https://www.usnews.com/news/blogs/data-mine/2015/10/19/the-inequality-of-who-gets-hit-by-cars
449	5B.06	Remove this proposed text. The type of bicycle facility should be selected based on the volumes and speeds of motor vehicles on a street, and not based on the existing technological limitations of CAVs. Bicycle facility selection is discussed extensively in FHWA's own document, the Bikeway Selection Guide.
462	6A.02	Revise the language around providing access and passage through TTC zones for bicyclists and pedestrians. With the removal of "reasonable safe" in terms of passage should be replaced with maintaining a similar facility or level of separation from motorists.
463	6A.02	In Section 6C.03 Line 6, clarification is needed on what type of information and what format should be provided for pedestrians with visual disabilities.
463	6A.02	In Section 6C.03 Line 12, clarification is needed on what type of information and what format should be provided for pedestrians with visual disabilities.
471	6C.02	Revise language that "work zone personnel may also provide assistance to the pedestrian as necessary" to say they must provide assistance if a pedestrian is allowed to navigate an active work zone.
471	6C.02	Remove the added statement regarding site roadways and the shortest route. It is unnecessary and a poor example regarding out-of-the-way travel.
471	6C.02	Remove the added statement about site roadways and the need to design the TTC zone to minimize conflicts between vehicles and pedestrians are it is redundant with other guidance.
471	6C.02	The Option on lines 29-31, page 476 (Clean Version) is not clear. It appears that FHWA is intending to state that routing pedestrians through an active worksite, rather than around, is not preferred. In reference to many of the Support and Guidance statements above, FHWA should clarify that context matters. If a worksite is very long and it is reasonable and safe to route pedestrians through the worksite, which would in turn avoid a long detour, there is no reason why this shouldn't be done. It is likely that it will be difficult to add this nuance to the language and it may be better to remove this Option as it has the potential to be used as an excuse more often than not.
471	6C.03	Correct publication numbers in this sentence - "Additional information on the design and construction of accessible temporary facilities is found in publications listed in Section 1A.05 (see Publications 12, 38, 39, and 42)."
510	6N.04	Suggest removing reference to speed in Part 6 and reference Part 9.
510	6N.04	Suggest removing reference to travel lane widths as it conflicts with Part 9 and instead reference Part 9.
516	6P.47	Figure 6P-47 - Revise the SHARE THE ROAD plaque to ON STREET or ON ROAD to be consistent with Part 9.
516	6P.47	Suggest removing reference to travel lane widths as it conflicts with Part 9 and instead reference Part 9. Figure 6P-47 has criteria for when to use the BIKES MAY USE FULL LANE vs Bike Warning sign with ON ROAD plaque, suggest relocating this criteria to Part 9.
517	7A.02	The Guidance statement should include "[...] or desired school crossings" on line 27 of the existing text.
517	7A.02	Remove "law enforcement" from line 25 of existing Section 7A.02 as they are not relevant to this work.
517	7A.02	It is widely accepted that best practice is to design and install crossings to match desire paths as people will continue to cross where it makes sense for them to. The existing MUTCD acknowledges this in existing section 7A.03 with the statement "students might become impatient and endanger themselves by attempting to cross the street during an inadequate gap". The first Support Statement (line 32) and the first Guidance statement (line 38) in existing Section 7A.02 should be deleted.
519	7A.03	It is necessary and important to acknowledge the consequences that the lack of sufficient gaps, both in frequency and duration, can have on school children given their lack of decision-making skills. The text in Existing Section 7A.03 should remain.
521	7B.02	Signage alone is not sufficient intervention and decreases the conspicuity of the sign. Delete first sentence in Support paragraph. Appropriate signage for School Area and School Zone should be better differentiated.
522	7B.03	Revise Guidance statement in Existing Section 7B.12 (Revised Section 7B.03) to be an Option statement.
528	8	Suggest adding language and figures for situations when light rail is center-running along a roadway especially the interaction with pedestrian crossings and bike facilities.

582	9A.01	The first paragraph added to the Support section under 9A.01 is misleading, as many states afford bicyclists the same rights and duties of a pedestrian when operating on a sidewalk or within a crosswalk, which is common with shared use path design. The assumption that this applies "with few exceptions" is misleading. Remove this paragraph as State law will be considered in the development of bicycle facilities. The second paragraph is not needed and similar language isn't added to sections regarding design of motor vehicle lanes. It is known that the design should follow local traffic laws and is stated as such in Part 1. Remove this paragraph.
584	9A.02	Proposed paragraph 1 is a restatement of the purpose of the MUTCD and is already provided in Part 1. Repeating it in Part 9 is not necessary and appears to treat the design of bicycle facilities differently compared to the design of motor vehicle facilities (as this language is not repeated in any other sections). Remove this paragraph.
587	9B.01	When a bicycle movement at a signalized intersection does not have any conflicting movements with motor vehicles, a STOP or YIELD sign is appropriate as the control facing the bicyclist. Modify this section to identify this as an acceptable use.
588	9B.02	A bicycle symbol, rather than the words BICYCLIST OR BICYCLE, should be used whenever possible. Change R3-7bP by replacing the words BICYCLES with a bicycle symbol.
588	9B.03	"Physically-separated" is not defined in the manual. Since the Option statement allows this sign to be installed on intersection approaches with separated bike lanes (which is a desired use of this sign), additional clarification as to what constitutes physical-separation in this context is needed.
593	9B.11	A version of the R10-15 that has both the pedestrian and bicyclist is appropriate for the scenario described in the Support statement here; the R10-15 with just the pedestrian symbol does not provide awareness that bicyclists may also be located to the right, as in the case of a shared use path or a separated bike lane. Related to NPA Item #99, add a version of the R10-15 with the bike symbol to the Manual and reference here. Similarly, the new R10-12b does not address the possible presence of pedestrians (as in a shared use path or bike lane + sidewalk). The modified R10-15 with both the pedestrian and bicycle symbol applies to both scenarios. Remove the new R10-12b sign unless evidence is provided to support superior comprehension or outcomes in behavior.
594	9B-4	Figure 9B-4 shows yield markings at various distances ahead of the crosswalk and the text does not make it clear why the distances would vary in each of these scenarios. For instance, in Figure 9B-4D it appears that the yield markings are a distance of 20-40', matching the requirement for a mid-block crosswalk; this distance is excessive when considering the speed of bicyclists. Revise the Figure and corresponding Support statement in Section 9B.12 to make it clear the location is per engineering judgment.
594	9B-4	Figure 9B-4C does not show the floating bus stop correctly; the curb ramp from the intersection crosswalk requires a "nose" on the bottom of the crosswalk so that a vision-impaired person would not inadvertently walk into the intersection. This nose is often challenging to fit in retrofit installations due to turning vehicles. Modify the figure to correctly follow accessibility requirements.
594	9B.12	In previous edition of the manual, the R9-6 sign was predominantly used in areas where shared use paths entered congested zones. The way this sign is used in the NPA is nearly the same as how the R1-5 is used for motor vehicles. As such, a version of this sign must address "STOP FOR" states in the same manner as the R1-5a. Figure 9B-4D, when considering a "STOP FOR" state makes it clear why another version is necessary. Add a second version of this sign.
595	9B.14	Change the sign number from R4-11 to R9-20 to match the proposed changes to Figure 9B-1. Make similar changes to Part 2 and 6, as appropriate.
596	9B.15	Similar to Options for other signs, add an Option to allow a STATE LAW plaque per engineering judgment and where applicable.
599	9B.18	Remove Paragraph 5, or item C in the list, from the Standard. This statement is too vague to have meaning. Move the discussion on railroad track crossings to a Guidance statement. Lastly, change Paragraph 10 from a Standard to a Guidance statement.
600	9B.19	It is not possible to comment on the new Option statements for use of signs R9-24 through R9-27 as these signs are not labeled on Figure 9B-7 and it is not clear which sign is which. Table 9A-1 identifies that there are many different variations of these signs proposed and review is necessary for comment. Remove this content from the update until it can be properly reviewed by the public.
602	9B.21	As noted in NPA #593 response, a version of the R10-15 with both a pedestrian and bicycle symbol is needed for many instances which are common, including for both left turn and right turn locations. The addition of the R10-12b does not provide enough information for instances of a shared use path or a separated bike lane + crosswalk. Add this modified sign to the Manual and remove the new sign unless evidence is provided to support superior comprehension or outcomes in behavior.
606	9C.05	A bicycle symbol, rather than the words BICYCLIST OR BICYCLE, should be used whenever possible. Change W16-20P by replacing the words BICYCLES with a bicycle symbol.
607	9C.06	A bicycle symbol, rather than the words BICYCLIST OR BICYCLE, should be used whenever possible. Change W16-21P by replacing the words 2-WAY BICYCLE CROSS TRAFFIC with a bicycle symbol and two arrows.
609	9C.08	Figure 9C-1 has not been modified to match the new text. Remove and replace the "SHARE THE ROAD" plaque with the "IN ROAD" plaque to match the proposed text.
611	9D.01	A 2018 Study at the Pennsylvania State University showed that people frequently overestimate the time it takes to bicycle a known distance. For this reason, travel times on bicycle wayfinding signs can be useful and can contribute to acceptance of bicycling as a mode choice, especially for short trips. In urban environments, the travel time is unlikely to vary much between users due to the shorter blocks and signalized intersections. Remove the Guidance statement which states that travel times should not be used on Bicycle Destination signs as the reasons provided for its inclusion are not supported.
612	9D.02	Many of the proposed signs are not shown in figures and therefore cannot be reviewed. For example, D11-1d, D11-1e, D11-1f, and D11-1g appear in the text and tables but do not appear in the proposed figures. A 2018 Study at the Pennsylvania State University showed that people frequently overestimate the time it takes to bicycle a known distance. For this reason, travel times on bicycle wayfinding signs can be useful and can contribute to acceptance of bicycling as a mode choice, especially for short trips. In urban environments, the travel time is unlikely to vary much between users due to the shorter blocks and signalized intersections. Remove the Guidance statement which states that travel times should not be used on Bike Route signs as the reasons provided for its inclusion are not supported.
613	9D.03	Remove the new Standard prohibiting the use of a bicycle symbol on a Street Name sign. This may be desirable to alert motorists on arterial streets which cross bicycle boulevards to the presence of bicyclists and should be an option to practitioners. It is successfully used in some jurisdictions and safety issues are not known with its application. FHWA should provide evidence that this results in poor safety outcomes prior to introducing new standards to restrict its use.

616	9D.06	Evidence of better safety outcomes with the use of green background color and which border for these signs is not known. Why is FHWA proposing a new Standard that limits the flexibility of practitioners to design unique, community focused bicycle wayfinding signs? It appears that FHWA would like all signs, even if they are intended to be used by bicyclists traveling at much lower speeds, to look and feel like highway signs, and that this uniformity somehow equals safety. Many non-standard signs, with background colors and borders different from the proposed language are installed today and have not demonstrated a safety concern. Without evidence to support the new Standard, FHWA should change this to a Guidance statement.
618	9D.08	Fix figure reference on line 9, page 679 (Clean Version).
621	9D.12	Section 2D.55 on Community Wayfinding signs allows for adaptations for motor vehicle signs that use background colors other than green, as part of a color-coded community wayfinding system. The proposed Option starting on line 32 of page 682 (Clean Version) restricts this use of other colors to locations where a shared-use path is not within the right-of-way or not crossing a street or highway. The restriction on where the color-coding can be used does not allow for uniformity across a wayfinding system. Remove the proposed Option statement to allow color-coding to exist in all locations where the signs are used. This is another example of bias in the guidance. There is no reason to mandate bicyclists wayfinding signs match the design of motorists highway signs. The strict uniformity being proposed for these signs is based on a highway standard and not appropriate for bicyclists who operate at speeds closer to pedestrians than motorists operating at 60mph on the freeway. FHWA should revise the entire bicyclists wayfinding guidance to clarify that bicycle wayfinding signs may follow community wayfinding principles with the goal of establishing a uniform design for the community system. The community definition for the purposes of bicycle wayfinding signs should state that this applies to regional trail systems such as the East Coast Greenway which may have unique, but standardized design to promote the unique identify of that trail network which crosses multiple states
621	9D.12	As stated in response to NPA #616, it is not clear why FHWA is introducing new standards to control the colors on bicycle wayfinding signs, especially those which appear on shared use paths. Why should bicycle wayfinding, especially signs located on paths which are not within the roadway, follow the same principals as highway design? It does not make sense that this would result in greater safety and practitioners should be given the flexibility to create systems that are unique to their communities. Further, FHWA is not consistent in the proposed these signs are treated across roadway users, as special restrictions are added to the bicycle wayfinding signs which do not exist for motor vehicle signs. As an example, Section 2D.55 on Community Wayfinding signs allows for adaptations for motor vehicle signs that use background colors other than green, as part of a color-coded community wayfinding system. The proposed Option starting on line 32 of page 682 (Clean Version) restricts this use of other colors to locations where a shared-use path is not within the right-of-way or not crossing a street or highway. FHWA needs to rethink the approach to wayfinding generally, to allow practitioners to design systems which consider all modes and provide flexibility to allow community input.
623	9E.01	Many agencies use the "helmeted rider" bicycle symbol. Although states may choose to revise the bicycle rider detail in their own adoption of the Manual, allowing the use of both symbols will provide the most consistency between MUTCD and state MUTCDs.
623	9E.01	Related the definition of Shoulder in NPA Item #17, bicycle travel is frequently designated in shoulder areas on all types of roadways. FHWA should modify this statement in conjunction with changes to the definition of Shoulder to make it clear that this restriction only applies to shoulders on limited access freeways.
624	9E.02	The phrase "controlled by a traffic signal that displays bicycle signal indications" may be misconstrued to mean a bicycle traffic signal is required. Change to read: "A through bicycle lane may be positioned to the right of a right-turn only lane or to the left of a left-turn only lane provided that the bicycle lane through movement is separated from the general turning movement by a traffic signal".
624	9E.02	9E.01 allows for agencies to use a bike lane symbol or word markings for bicycle lanes, and the arrow marker is optional. Requiring both a bicycle symbol and arrow for this particular treatment (a bicycle lane between contiguous travel lanes) seems arbitrary. A single straight arrow for bicycle facilities is used to indicate direction of travel, not to restrict turns, and direction of travel is indicated by the orientation of the chosen bike lane symbol. The standard should be removed. If FHWA choses to require the use of an arrow with bicycle symbol for this treatment, allow the use of word markings with the arrow.
624	9E.02	For clarity change to read: "Bicycle lanes should not be marked within a general purpose lane at an intersection approach, either with dotted or any other line markings."
624	9E.02	Two conditions are described here - shifting a buffer or separated bicycle lane toward or away from the adjacent travel lane - and both refer to Figure 9E-7. However only one condition is shown in Figure 9E-7D. Add a second figure illustrating a separated bike lane shifting away from the travel lane
624	9E.02	Research (studies listed below) has found safety benefits associated with an offset distance with as little as 6 feet, which is less than a standard vehicle length. The rationale to provide an offset of at least one car length is the assumption that it will reduce the potential for rear-end vehicular collisions. However, there is no research to support this theory. FHWA is getting into areas that are best served by guidance documents and should not introduce these statements which are difficult to describe in the MUTCD setting and are not related to the uniformity of the traffic control devices themselves. Delete the Guidance statement starting on line 35, page 685 (Clean Version). Schepers, J.P., P. A. Kroeze, W. Sweers, and J.C. Wust. Road Factors and Bicycle-Motor Vehicle Crashes at Unsignalized Priority Intersections. Accident Analysis and Prevention, Vol. 43, 2011, pp. 853-861. Madsen, T., and H. Lahrman. Comparison of Five Bicycle Facility Designs in Signalized Intersections Using Traffic Conflict Studies. Transport Research Part F, Vol. 46, 2017, pp. 438-450.
624	9E.02	Revise the Support statement starting on line 1, page 686 (Clean Version) to read "Where a bicycle lane needs to be dropped to accommodate a general purpose turn lane ahead of an intersection, the general purpose turn lane may accommodate both through bicyclists and turning general traffic. Ahead of the approach, a mixing zone may be established to indicate the preferred path of bicyclists making the through movement." The NPA statement is vague and confusing as to what a mixing zone is and where it is located relative to the general roadway, an intersection approach, and the intersection.
624	9E.02	A mixing zone in any other context would be unlawful per the motor vehicle code. This standard is unnecessary, and should be deleted.
624	9E.02	Revise statement to read "Mixing zones WITH YIELDING AREA shall have yield markings..." This conforms to Figure 9E-05A
624	9E.02	This standard statement suggests that the bicycle lane continues to the intersection, which would negate the need for a mixing zone. Revise statement to read "Mixing zones WITHOUT A YIELDING AREA shall have shared lane markings and turn arrows in the turn lane".

624	9E.02	There is a large amount of research around the fact that mixing zones greatly reduce bicyclists safety and level of comfort; two such studies are "Cycling at a Crossroads" by New York City DOT (published Nov. 2018) and "Contextual Guidance at Intersections for Protected Bicycle Lanes" by the National Institute for Transportation Communities (published Dec. 2019). Revise the Support statement starting on line 14, page 686 (Clean Version) to read: "Mixing zones are not preferred as they do not maintain separation up to the intersection; it is preferable to maintain separation to minimize exposure to motor vehicles. Mixing zones should only be used if other options are not feasible. Without mixing zones, a bicycle facility may maintain a similar level of separation throughout the entire corridor."
625	9E.03	While the practice of marking bicycle lane extensions through intersections may be a good idea to help roadway users understand the path of travel of all modes through an intersection, engineering judgement should be used to determine which movements require extensions lines at intersection. Either change the Standard to Guidance to recognize the need to consider context when making this decision, or add Support to discuss the goals of marking extension markings for bicyclists by default, but not for other vehicle lanes. Relating specifically to driveways, change the Standard to Guidance; driveways may differ greatly and not all driveways benefit from markings. For example, a commercial driveway and a driveway for a single family home are vastly different. Commercial driveways may function more like intersections, but single family home driveways are insignificant in terms of total number of entry/exit events per day and width. Frankly, this type of statement is best located in a guidance document outside of the MUTCD because additional space can be dedicated to discussing context.
625	9E.03	FHWA should provide accommodation for the condition of a bicycle lane crossing being directly adjacent to a marked crosswalk. The proposed language requires that there is separation between the two, and that an outside extension line is always present. There is no practical reason why this would be necessary and when the space is not available, the outside extension line should simply be dropped rather than narrow the bicycle crossing. This will also reduce the cost of installation and maintenance by simplifying the marking layout. FHWA should make allowances for known situations where the available width is restricted, rather than ignore this context altogether.
626	9E.04	Rotated bicycle symbols are not referenced anywhere else in the manual. Remove the word "rotated".
627	9E.07	Change the proposed Standard starting on line 9, page 689 (Clean Version) to Guidance. Engineering judgment based on specific context should be used to determine the necessity and function of a buffer adjacent to a parking lane. Remove the second sentence in the Support which starts on line 14, page 689 (Clean Version); decision making regarding selecting a one-way versus two-way separated bike lane is context specific and better discussed in existing guidance documents; this language oversimplifies the issues and does not meaningfully help the practitioner. Regarding the Support starting on line 21, page 689 (Clean Version): the existing AASHTO Guide for the Development of Bicycle Facilities does not contain any information on separated bicycle lanes. Further, the facility type that is most similar to separated bicycle lanes in that document (sidepaths) has significantly different requirements within the context of the MUTCD, especially regarding signalization at intersection. While the forthcoming 5th Edition of the AASHTO Guide will surely address separated bike lanes, it is confusing to reference a document which currently does not provide that information. We suggest that the reference to the document in Section 1A.05 is sufficient and that FHWA should avoid providing guidance in the MUTCD.
628	9E.06	Remove Standard provided in bullet B. There is no research or human factors testing that has shown that roadway users are confused by a solid bike lane and whether they can cross the line to access an on-street parking space. There is no justification to dash a buffered bike lane adjacent to a parking lane, especially when bicycle lanes adjacent to parking lanes are solid. Unnecessary dashed lines pose installation and maintenance issues for agencies. The guidance statement on paragraph 4 could remain as is.
628	9E.06	There are conflicting statements about chevron markings and diagonal markings and when they may be used (lines 19-20, lines 30-31 in the Clean Version). Where buffer space is less than two feet wide, no markings are required. Where buffer space is two to four feet wide, diagonal markings are optional. Where buffer space is greater than four feet wide, diagonal or chevron markings are required. Revise Option statement on lines 19-20 to read: "Where a buffer space is less than four feet wide, one-directional diagonal markings may be used". Follow with a Standard statement: "Where a buffer space is four feet or wider, one-directional diagonal or chevron markings shall be used".
628	9E-6	The graphics provided for buffer separated bike lanes are unclear, provide too broad of context, and show marking configurations that are rarely if ever used. Use the graphics provided in 18B-BIK-05 proposed by the National Committee on Uniform Traffic Control Devices.
629	9E.07	There are conflicting statements about chevron markings and diagonal markings and when they may be used for buffered (9E.06) and separated bike lanes (9E.07). Where buffer space is less than two feet wide, no markings are required. Where buffer space is two to four feet wide, diagonal markings are optional. Where buffer space is greater than four feet wide, diagonal or chevron markings are required. Provide an option statement that says diagonal markings may be used in buffers that are less than four feet wide, and a standard statement that requires diagonal or chevron markings in buffers greater than four feet wide, unless physical separation is present.

629	9E.07	Remove the Standard starting on line 32, page 689 (Clean Version). The decision whether signal phase separation for a two-way separated bike lane is required at a signalized intersection should be based on the context and engineering judgment. Additionally, from an operational standpoint, a two-way separated bicycle lane is not different from a sidepath, which does not require any signal phase separation. Two-way separated bike lanes have been installed in a number of locations across the country with permissive motor vehicle turns and without safety issues. There is on-going research on this subject and FHWA should not preemptively get ahead of the research, but rather leave discussions on context to guidance documents and engineering judgment. This is an example of a biased restriction against bicyclists that is not applied to motorists. There is a wealth of research which shows that permissive motorists left turns at signalized intersections lead to increased crashes, yet there is no equivalent proposal by FHWA to restrict this practice, or in fact even mention it with recommended thresholds for managing permissive vs. protected phasing to improve motorist and pedestrian crashes. Remove the Guidance starting on line 42, page 689 (Clean Version). This language is confusing when taken out of context with the requirements and options in Section 4H.
629	9E.07	The ADAAG and PROWAG do not contain any reference to separated bicycle lanes, making this reference odd. While practitioners have been using those documents to interpret how best to meet the ADA regarding these facilities, it is not that helpful to reference a document which will not clearly identify how to handle separated bicycle lanes. We suggest that the reference included in Section 1A.05 to these documents is sufficient.
629	9E.07b	It is unorthodox to say that a bicycle lane is "behind" on-street parking, since dimensions are typically made in section. Change figure subtitle to read "One-way Bicycle Lane on One-Way Street with On-Street Parking".
629	9E.07b	The figure notes that parking is permitted in the buffer space, which is incorrect as the buffer space is the area adjacent to the bike lane. Recommend that this figure calls out the parking lane.
629	9E.07b	It may be useful to illustrate optional tubular markers in Figure 9E-7B
629	9E.07a and c	There are conflicting statements about chevron markings and diagonal markings and when they may be used for buffered (9E.06) and separated bike lanes (9E.07). Where buffer space is less than two feet wide, no markings are required. Where buffer space is two to four feet wide, diagonal markings are optional. Where buffer space is greater than four feet wide, diagonal or chevron markings are required. Revise figures to reflect this.
629	9E.07d	Proposed NPA text in 9E.02 describe two conditions, but only one of those conditions is shown in 9E.07. Recommend adding a figure to illustrate a buffered or separated bicycle lane shifting away from the travel lane. Also recommend making terminology between text and figures the same, i.e. "shift away from curb" and "shift away from travel lane."
629	9E.07	Add statement that left turns on red shall also be prohibited across separated bicycle lanes (applicable to one-way streets).
630	9E.08	Counter-flow lanes are defined in the NPA as opposing-direction lanes "designate for peak direction of travel", which is inappropriate for bicycle facilities. Change to "contra-flow" and add a definition to Part 1.
630	9E.08	There are many places in the US where contra-flow bike lanes exist between a travel lane and a parking lane. Remove this standard statement. There is no research to suggest that this practice is unsafe. Remove this standard statement as it reduces an ability to improve bicyclist safety and improve bicyclist accommodations on one-way streets in urban areas which have a high amount of parking. For example, Washington, DC has had a few miles of contraflow bike lanes installed in this configuration for almost a decade with evidence of a safety problem.
631	9E.09	Per 3H.06, green colored pavement is used to enhance the conspicuity of word, symbol, and/or arrow pavement markings. Many communities throughout the US have use green pavement markings behind shared use lane markings to increase conspicuity of the symbol, especially in the context of bicycle boulevards. Revise to state that green-colored pavement may be used behind shared use lane markings, as an option.
632	9E.10	Add statement: "If used, shared lane markings should be place in the center of the travel lane in a circular roadway." Conflicts can occur when motorists try to overtake a bicyclist while also needing to exit a circular roadway. Bicyclists should be encouraged to take lane.
634	9E.12	Remove the proposed Guidance statement on lines 41-44, page 693 (Clean Version). The MUTCD is not a guidance document and is not equipped to provide meaningful discussion on contextual considerations. The language that is provided is vague and essentially meaningless. This discussion is best left to guidance documents that can address what a "discernible number of conflicts" might mean under various contexts. Further, this proposed language opens up liability to agencies since the word "discernible" is highly subjective.
635	9E.13	We agree that marking crosswalks for shared use paths should be the default practice and that the practitioner should have the burden to demonstrate why a marked crosswalk is not needed, rather than the other way around. The problem with the new Standard that FHWA is proposing here is that they are not proposing a similar Standard for marked crosswalks at signalized intersections. The reasons for marking these two instances are not different. One approach would be to expand the proposed Standard language to consider the types of roads where marked crosswalks shall be marked, rather than stating that all crossings be marked. For instance, marking crossings at all arterial and collector crossings, or other types of roadways where speeds are high, should be made a priority. The FHWA STEP guidance provides ample discussion on the situations where a marked crosswalk makes sense based on motor vehicle speed and volume. There is no reason not to reference that document here, and to also reference it for other crossing improvements, such as RRFBs.
635	9E.13	Remove reference to high volume as it is vague.
640	9G	Section 9G cannot be reviewed as the proposed revisions to the text, figures, and tables in the Manual were not provided for public comment. Remove these proposed revisions from the Manual until a time when they can be properly reviewed and commented on by the public.
n/a	9C.04	In Paragraph 2, remove the word "unconventional" from the proposed Support statement. These signs are frequently used on notably conventional facilities, such as shared use paths.
n/a	6B.09	Revise language in Detours and Diversions to include that bicyclists are reluctant to retrace their steps or to add distance or out-of-the-way travel to a destination.