

Comment on Proposed Definition of Intersection

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The proposed MUTCD §1.C.02.106(b) amends the definition of “intersection” to exclude the “junction of a... side roadway with a public roadway or highway... unless the public roadway or highway at said junction is controlled by a traffic control device.” MUTCD §1.C.02.106(c) further amends the definition to state that on highways with medians, there are two separate intersections “if the opposing left-turn paths cross and there is sufficient interior storage for the design vehicle.”¹

The proposed amendment has severe flaws:

- The wording is unclear and ambiguous.
- Highway users will often be unable to determine whether they are at an intersection, and therefore will not know who has the right of way when conflicts occur.
- The new definition drastically curtails the rights of pedestrians on suburban arterials, already the most deadly and difficult places to walk. This will compound existing inequities in our transportation system.
- Many valuable traffic control devices are only authorized by the MUTCD at intersections.

The definitions of “site roadway” and “public road,” which the definition of “intersection” relies on, are also ambiguous.

Note that the term “side roadway,” which is at the heart of the new definition of “intersection,” is not defined. The only other place in the MUTCD where I have seen it is §4C.06. It is possible that this is a misprint for “site roadway,” a term newly defined in the current proposal. As FHWA has not responded to the request for clarification I submitted several months ago, I will address both “side roadway” and “site roadway” in this comment.

Clarifying these definitions would improve the document, but it would not resolve the underlying problem. Their inconsistencies and ambiguities are only partly the result of poor drafting. The root cause is that the MUTCD is trying to do what is outside its mandate and indeed impossible – to direct the entire nation’s traffic by a system of centralized control. The role of the MUTCD is to ensure that traffic control devices are understandable and uniform, not to tell traffic engineers where they are needed or to legislate the rules of the road.

My specific recommendation for the definition of “intersection” is that it should be deleted.

¹§4C.01 contradicts §1.C.02.106(c) by allowing this to be determined by engineering judgment.

Is this an intersection?

The proposed definition raises many questions. One very general issue is the meaning of “controlled by a traffic control device.”

Lane markings, centerlines, and yellow crosshatch markings are all traffic control devices. Reading the definition literally would make every curb cut on an arterial highway an intersection. That was surely not the intent of the MUTCD drafters.

At a very minimum, the definition should correctly convey the drafters’ intent. A possible fix is to use the newly proposed definition of “uncontrolled approach.” In §1.C.02.106(b), “by a traffic control signal, stop sign, yield sign, or hybrid beacon” would replace “by a traffic control device.”

A more complex issue is to distinguish the “side roadway” (or “site roadway”) from the “the public roadway or highway.”² The proposed definition assumes the user of the MUTCD can tell one from the other. But junctions of two public highways and junctions of two site roadways are common occurrences.

As a concrete example of the difficulties the new definition creates in such cases, consider the junction of George Washington Memorial Parkway, Tulane Drive, and a branch of the Mount Vernon Trail in Fort Hunt, Virginia. The Parkway median is wide enough to store a car, the largest vehicle allowed on the Parkway, so under the proposed §1.C.02.106(c) there are two potential intersections here – the junction of the southbound Parkway lanes and Tulane Drive, and the junction of the northbound Parkway lanes and the trail.

At this particular junction, George Washington Parkway is a public highway and a site roadway (it is a National Park), but not in ordinary usage a side roadway. Tulane Drive is a public highway, but not a site roadway. The Mount Vernon Trail branch is a public highway and a site roadway. Tulane Drive is the side roadway from the viewpoint of



²Neither “public roadway” nor “public highway” is defined in the MUTCD, but “public road” is defined as “any road, street, or similar facility under the jurisdiction of and maintained by a public agency and open to public travel.” In ordinary language, a side roadway certainly can be public road. The proposed definition of “site roadway open to public travel” explicitly includes governmental facilities such as airports, schools, universities, and parks that are commonly maintained by public agencies.

a driver. The trail roadway is used by bicyclists and pedestrians but very rarely by motor vehicle drivers, so arguably from the perspective of that highway's users the trail branch is the main roadway and the Parkway, which carries much less bicycle and foot traffic, is the side roadway.

If the definition was meant to say "site roadway," its application here is straightforward but counterintuitive. Tulane Drive is "the public roadway" and is not the site roadway. It has a stop sign, so the junction of the southbound Parkway and Tulane Drive is an intersection. The junction of the northbound Parkway and the bike trail is not an intersection, because neither highway has a stop or yield sign, traffic signal, or hybrid beacon.

If "side roadway" is the intended text of the definition, it is unclear whether "the public roadway or highway" includes Tulane Drive, which is a public highway and, from the driver's perspective at least, also a side roadway.³ The southbound Parkway has an intersection if Tulane Drive counts as "the public roadway," and otherwise not. The northbound Parkway has no intersection .

The existence of an intersection at Tulane Drive on the southbound lanes of the Parkway but not on the northbound lanes would be highly problematic. Unmarked crosswalks would extend only half way across the highway. If traffic volumes were to exceed the levels specified in the signal warrant of §4C.02.04, traffic signals could be installed on the southbound lanes but (because the warrant only authorizes signals at intersections) no signal could be installed on the northbound lanes. Northbound vehicles would not face a signal, but when making a left turn onto Tulane Drive they would drive through the middle of a signalized intersection. This would create a safety hazard.

Am I at an intersection?

Under the proposed definition, highway users will frequently be unable to determine whether a junction is an intersection. This will create serious safety hazards.

Highway users need to know whether they are at an intersection. The right-of-way rules for conflicting movements at intersections are different from the rules for vehicles and pedestrians entering or crossing a highway between intersections. Pedestrians have the right of way in unmarked crosswalks at intersections, but unmarked crosswalks do not exist at non-intersection junctions.

³An alternative way to resolve this ambiguity, instead of substituting "site roadway" for "side roadway," would be to use the defined terms "major street" and "minor street" in place of "side roadway" and "the public roadway or highway." But that would raise new problems. The MUTCD definitions of major and minor street count only vehicular traffic and not foot traffic, even when one of the streets is a trail designed for pedestrian travel on the roadway. Moreover, intersections defined in terms of major and minor streets would vanish and reappear as vehicular traffic volumes fluctuate. An intersection should be a feature of the roadways, not of the traffic they carry.

The highway user approaching a junction will have to make at least two determinations. First, which highway or highways qualify as “the public roadway or highway”? Second, is the public roadway controlled by a traffic signal, stop or yield sign, or flashing beacon?

A “public road” is defined as only those highways “maintained by a public agency.” You cannot tell who maintains a roadway by looking at it. Even when maintenance work is under way, the workers often will be employed by contractors and won’t be able to say who is ultimately responsible. This is particularly a problem in communities governed by homeowner associations, where roads are often privately owned and maintained. Drivers will need to do title searches to figure out if they are at an intersection.

Moreover, recent decades have seen the flowering of street maintenance and street ownership by mixed public-private entities. It is often unclear whether these are public agencies. Privately organized Business Improvement Districts often take over street maintenance in part or in full. Zoning boards frequently require private developers to build and maintain various types of highways, such as city streets and bicycle paths. Under the proposed definition, a driver approaching a junction might need to consult many-years-old zoning approvals to determine whether to yield to another driver approaching from the right.

A further dilemma arises on roads with medians. There are two potential intersections if the median width exceeds the design vehicle length, but only one otherwise. Highway users will need to identify the roadway’s design vehicle to determine who has the right of way.

Consider the case of a driver traveling northbound on George Washington Parkway who, when approaching Tulane Drive, sees a bicycle go east on Tulane Drive, cross the southbound lanes, and enter the median. If the driver is approaching an intersection, the cyclist will reach it first and has the right of way; if there is no intersection in the northbound lanes, the driver has the right of way. To determine whether there is an intersection, the driver needs to know: (1) the design vehicle, (2) whether Tulane Drive and/or the bike trail qualifies as “the public roadway or highway,” and (3) whether Tulane Drive and the bike trail have stop or yield signs (which will be hard to see because the oncoming driver approaches them from the side).

The driver’s decision logic depends on the design vehicle. If the design vehicle is an 18-wheel truck, both sides of the Parkway constitute a single potential intersection and the remainder of the decision tree is as follows:

- If neither Tulane Drive nor the bike trail is “the public roadway or highway,” there is no intersection and the driver has the right of way.
- If the bike trail qualifies as the public roadway but Tulane Drive is maintained by an HOA, the right of way belongs to the driver if the bike trail has a stop sign and the cyclist if it does not.
- If Tulane Drive qualifies as the public roadway because it is the only non-site roadway at the junction, the right of way belongs to the driver if Tulane Drive has a stop sign and to the cyclist if it does not.

- If both Tulane Drive and the bike trail qualify as the public right of way, the driver has the right of way if either one has a stop sign and the cyclist has the right of way if neither does.

If the design vehicle is a car, the logic is different. The existence of an intersection on the northbound side of the Parkway is a separate question from the southbound side. A stop sign on Tulane Drive can make the southbound-side junction an intersection but not the northbound side. The cyclist gets the right of way in two situations where a larger design vehicle would give it to the driver:

- When Tulane Drive has a stop sign and counts as the public roadway because it is the only non-site roadway
- When both Tulane Drive and the bike trail count as the public right of way, and Tulane Drive has a stop sign but the bike trail does not.

Even in much less complex situations, an instant analysis of such questions is far beyond the capability of the average driver who is rapidly approaching a junction.

Pedestrian rights curtailed

On multi-lane arterial highways in suburbs, which are the most dangerous roads for pedestrians, traffic stop signs are rare and traffic signals can be widely spaced. Using the “side roadway” version of the new definition with “controlled by a traffic control signal, stop sign, yield sign, or hybrid beacon” replacing “controlled by a traffic control device,”⁴ only the few signalized junctions would be intersections. Unmarked crosswalks associated with the former intersections would be eliminated.

Pedestrians would be severely affected. With both adjacent intersections signalized, it would be illegal to cross the street between the traffic signals, no matter how distant they are, except in a marked crosswalk. Even the pedestrian who takes a long walk to the traffic signal to cross the street would be endangered – where crossings of side streets do not have enough foot traffic to meet the warrant for mid-block marked crosswalks, turning vehicles would have the right of way over pedestrians walking straight down the sidewalk.

Highway agencies could, in theory, preserve crosswalks across these arterials by marking them, but guidance in the new §3C.02 strongly discourages that. Agencies are instructed to undertake an engineering study and do expensive construction before marking an arterial crosswalk. No agency has the money, the time, or the will to do this work on more than a handful of the dozens, hundreds, or thousands of the arterial crosswalks that will be obliterated in even a small jurisdiction.

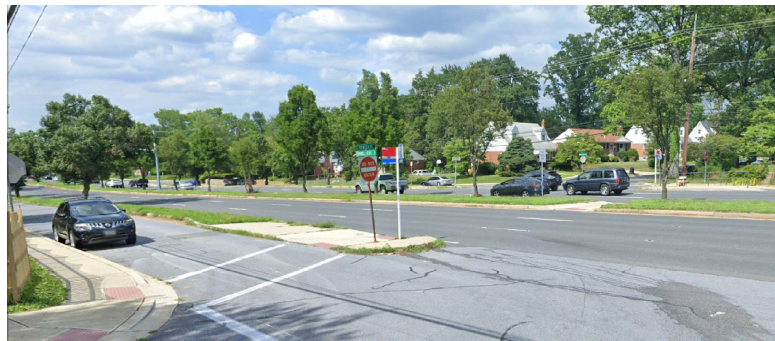
⁴The “site roadway” version has similar negative effects, but at fewer junctions.

The harm this would do to low-income pedestrians can hardly be overstated. Poverty in the United States is increasingly concentrated in lower-income suburbs where many residents do not own cars. Transportation facilities were built for travel exclusively by automobile and feature multi-lane high-speed arterials that often lack sidewalks. As Angie Schmitt has documented in *Right of Way*, the consequence has been the effective criminalization of walking in many places and an epidemic of needless deaths. The proposed definition of intersection would exacerbate these severe injustices.

As an example, consider Connecticut Avenue (Maryland Route 185) from Weller Road to Independence Street in Wheaton, Maryland. The two signalized intersections are one mile apart. There are no traffic signals or marked crosswalks between them. Four pedestrians have been injured in collisions on this stretch of road since 2015.

The surrounding neighborhoods have a large low-income and minority population, and buses on Connecticut Avenue are heavily used. The proposed definition would make it illegal to walk across the entire one-mile stretch of Connecticut Avenue. To obey the law, a bus rider living half-way between the two signals would need to walk an extra half mile out of their way each day.

In recent years, Montgomery County DOT and Maryland SHA have tried to make walking safer in this area by upgrading crosswalks at bus stops. One of these crosswalks, across Connecticut Avenue at Isbell St., is shown here. The intersection was retrofitted with ADA-compliant ramps and an ADA-compliant median refuge.



As part of the improvements, the portion of the crosswalk in the service road was marked. However, in compliance with MUTCD §3B.18.09 (the parallel section to the new §3C.02), the agencies did not mark the crosswalk in the main travel lanes. Under the proposed definition, this would no longer be a crosswalk. The other upgraded crosswalks similarly lack markings in the travel lanes.

The MUTCD revision makes a gesture toward this issue by adding a standard in §3C.01: “Crosswalk markings shall be provided at non-intersection crosswalk locations.” This seems intended to ensure that new mid-block crosswalks will be marked. But the warrants and guidance remain heavily tilted against mid-block crosswalks. The new definition will result in a massive loss of pedestrian mobility.

The net effect of the new definition is to further disadvantage low-income and minority

pedestrians in aging suburbs – the very persons whose daily movements are already heavily constrained to serve the convenience of drivers. The last thing the new MUTCD should do is worsen the treatment of those who are already subjected to second-class treatment by our roadways.

Driver facilities

Numerous traffic control devices, valuable for the safety and convenience of drivers and pedestrians alike, are only authorized at intersections under the MUTCD. The proposed definition will deprive all road users of their benefit at junctions that are no longer intersections.

Standards for numerous signs and pavement markings authorize their use only at intersections. The list starts with stop sign warrants in §2B.11 through §2B.14 and goes on and on. Under the proposed definition, junctions at which the main roadway does not have a stop sign, yield sign, or traffic signal will not be intersections. Prohibiting new installations of these devices at these non-intersections would significantly impede safety improvements and congestion relief.

A further difficulty relates to the “Do not block intersection” sign. Redefining “intersection” would change the rules of the road by allowing drivers to block non-intersection junctions. As with unmarked crosswalks, this would effectively override state laws. Moreover, the sign itself is meaningless at a junction that is not an intersection. Traffic engineers would lose a useful tool.

The new definition also has negative effects on traffic signal warrants. Support and guidance for several of the warrants implies that they apply only at intersections. The effect on Warrant 5, for children walking for school, is particularly bad. The guidance in §4C.06 states that a signal that is warranted because many schoolchildren are crossing the street at a non-intersection junction where the side street has a stop sign should be placed at least 100 feet away from that junction.

Conclusions

The discussion above shows that the proposed definition of “intersection” is inscrutable. The more you look at it, the harder it is to understand. Some of my conclusions about who has the right of way may very well be wrong – but that would only reinforce the basic finding that the definition is unworkable.

The MUTCD already imposes manifold dangers and inconveniences on low-income pedestrians. It forces them to risk injury and death just to cross the street, for the convenience of drivers. The proposed revision in the definition significantly exacerbates this injustice.

The proposal to modify the definition of “intersection” should be rejected and the definition should be deleted entirely from the MUTCD.

The problems unearthed here are symptoms of deeper problems, the unfair treatment of highway users other than drivers and the failure to follow principles of control theory and human factors engineering. These issues must be addressed by a complete recasting of the MUTCD. Elements that are outside the mandate of the MUTCD and usurp the roles of legislatures and local traffic agencies, such as warrants for signals and crosswalk markings, should be removed.