

CITY OF ROCKVILLE

Marked Crosswalk Guidelines

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Metropolitan Washington
Council of Governments

Marked Crosswalk Guidelines

Introduction

Intersections, marked or unmarked, are legal crosswalks in Maryland (§ 21-101). At mid-block locations, legal crosswalks are only where the road is marked. Crosswalks vary in design based on the location, road type, and usage; the designs can vary from just two white lines running parallel to each other to indicate a crossing to a raised crosswalk with flashing devices to bring more awareness to road users of the crossing.

This Marked Crosswalk Guidelines serves as a guide to identify when a marked crossing can be considered. The Guidelines are consistent with the Maryland MUTCD. The guidelines are not meant to provide additional guidance to engineering judgement made on a case-by-case basis.

These guidelines have several parts:

- **Marked Crosswalk Decision Flow Chart** – describes how Rockville identifies locations where crosswalks are recommended.
- **Pedestrian Demand Table** – used in conjunction with the flow chart to identify the pedestrian demand that can be used in the flow chart.

- **Crosswalk Design by Roadway Type Table** – used once the flow chart identifies a crosswalk is recommended to provide guidance broadly on the type of crosswalk that should be considered.
- **Pedestrian Crossing Toolkit** – provides more details on the different enhancements that can be implemented at crossings.

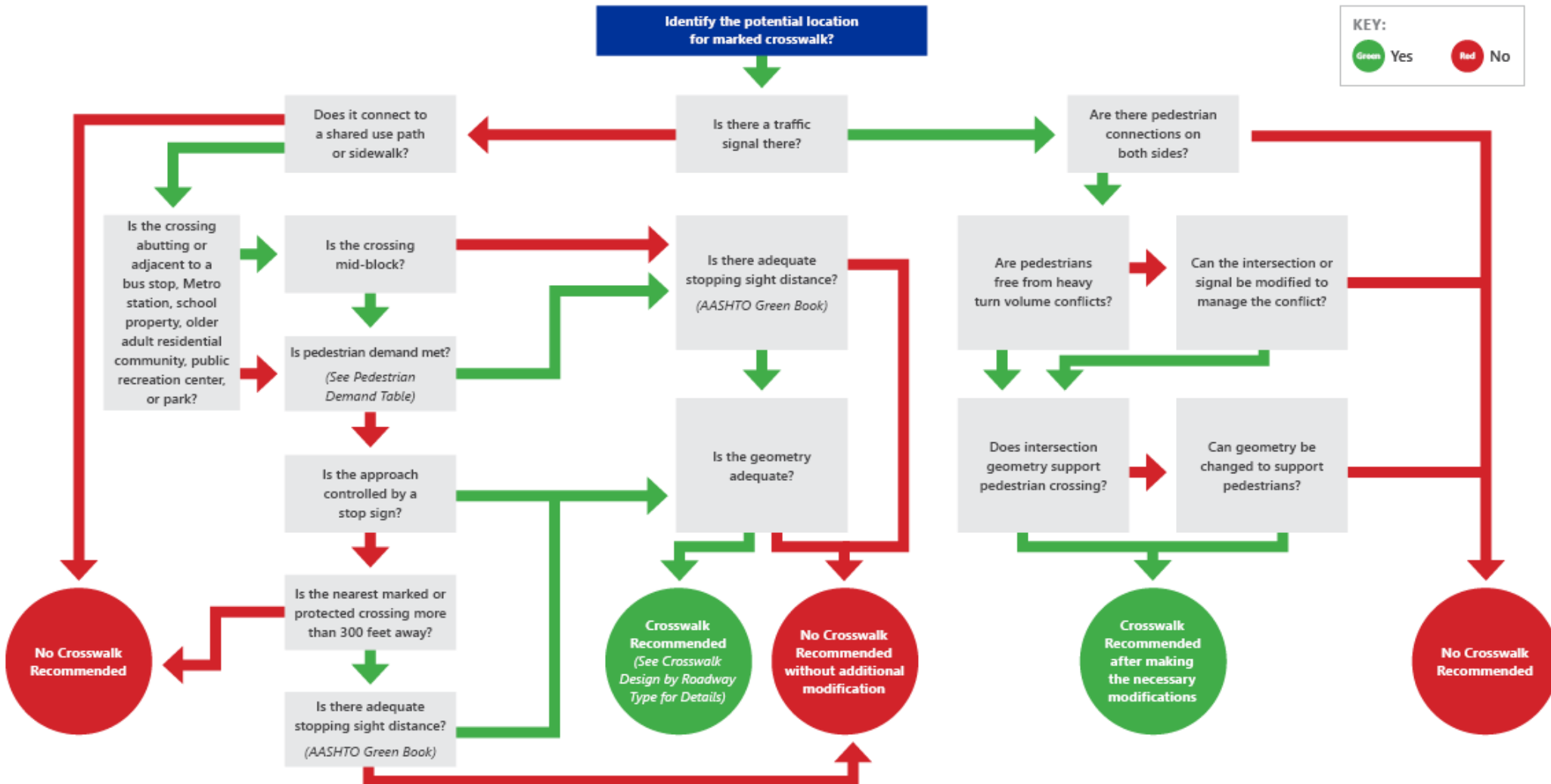
Background

These guidelines were developed after identifying best practices from Federal, State, and local governmental agencies. Many State and local governments use the Federal Highway Administration (FHWA) Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations published in 2018 and NCHRP 562 as a foundation and adjusted the guidelines to meet their needs, which is the basis on which these guidelines were developed.

Evaluating Locations

Each potential location for a marked crosswalk is to be identified and the flow chart in **Figure 1** should be used.

Figure 1: Marked Crosswalk Decision Flow Chart



To use the flow chart, start at the top and follow the arrow based on your response to the questions. For instance, the question in the box asks, “Is there a traffic signal there?” If the answer is “Yes”, follow the green arrow to the next box and if it is “No” follow the red arrow to the next box. Continue until you have reached a circle; a red circle would mean a crosswalk is not recommended and a green circle would indicate a crosswalk is recommended.

Use the following definitions and instructions in the following sections for using the Marked Crosswalk Decision Flow Chart.

Identify Location

The marked crosswalk decision flow chart begins with a specific location identified. This location can be requested by a member of the public, included as part of a city capital improvement project, or the location of a recent pedestrian or bicyclist crash and recommended for enhancement through the city’s Vision Zero Action Plan.

Pedestrian Connections

This concept is noted to indicate that there is a sidewalk or another connection that the pedestrian would access and not be stranded without a sidewalk or a shared-use path once the approved American with Disabilities Act (ADA) compliant ramp is installed. A T-intersection with sidewalks on both sides of the intersecting streets would be considered as having a pedestrian connection on both sides.

Heavy Turn Volume Conflicts at Signalized Intersections

The left and right turn volumes that will be crossing at the intersection is to be examined to see if a high number of vehicles that would conflict with the pedestrians crossing the street exists. If there are heavy turn volumes, engineering judgment and review is needed to determine how the conflict can be managed. The Pedestrian Crossing Toolkit provides several options that may be considered to manage the conflict.

Pedestrian Demand

Pedestrian Demand is the highest number of pedestrians that use the crosswalk per hour. To determine if a location meets this criterion, a pedestrian count during the anticipated peak hour is to be completed. Count the number of pedestrians at the candidate crosswalk location within the vicinity that pedestrians are likely to use the proposed location. Vulnerable pedestrians, the elderly and disabled persons, count twice towards the volume thresholds when the data is available. Professional judgement is used to identify vulnerable pedestrians.

Table 1. Pedestrian Demand

UNCONTROLLED LOCATIONS DEMAND		PEDESTRIAN DEMAND PER HOUR*	
		INTERSECTION	MIDBLOCK
		20	40

EXCEPTIONS			
FACILITY	DISTANCE	PEDESTRIAN DEMAND PER HOUR*	
		INTERSECTION	MIDBLOCK
School	¼ mile	10 (7)	20 (14)
Park	250 ft	10 (7)	30 (21)
Shopping Center	250 ft	15 (10)	30 (21)
Place of Worship	250 ft	15 (10)	30 (21)
Public Recreation Center	250 ft	15 (10)	30 (21)
Bus Stop	250 ft	15 (10)	30 (21)
Metro Station	250 ft	17 (12)	30 (21)
Equity Zone	In Zone	17 (12)	30 (21)

* On roads with speeds at 35 mph or less (On roads with speeds greater than 35 mph)
 Elderly and disabled people are equivalent to 2 pedestrians

The pedestrian demand table uses the FHWA guideline as the default for uncontrolled locations of 20 pedestrians per hour at an intersection and 40 pedestrians per hour for a midblock crossing. The city recognizes that there are facilities that are prone to contribute to high levels of walking and would like to encourage the walking trips made within 250 feet by providing marked crossing at the intersections and reducing the midblock crossing demand. These facilities are schools, parks, shopping

centers, places of worship, public recreation centers, bus stops, metro stations and locations within county and state identified equity zones.

There is also a further reduction in demand requirements when the road has a speed limit greater than 35 mph. The reason is that the higher the speeds the higher pedestrians are at the higher risk of serious injuries crossing the street.

Stopping Sight Distance

The American Association of State Highway and Transportation Officials (AASHTO), a Policy on Geometric Design of Highways and Streets manual (also known as the “Green Book”) notes that sight distance is “the length of the roadway ahead that is visible to the driver.” The Green Book provides equations and tables to identify the sight distance for different design speeds. The stopping sight distance (SSD) is to be calculated to determine if vehicles have adequate time to stop if a pedestrian is in the crosswalk.

Table 2 provides the SSD for various speeds on a level roadway.

Table 2: Stopping Sight Distance on Level Roadways

Design Speed (mph)	Stopping Sight Distance (ft)
15	80
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495

Adequate Geometry

The geometry of the location should be reviewed, and engineering judgment will be needed to identify if the locations support the installation of a safe crosswalk that can have adequate ramps and drainage to comply with the City of Rockville standards.

Crosswalk Design by Roadway Type

Once the flow chart has identified if a marked crosswalk is recommended, **Table 3** (the Crosswalk Design by Roadway Type Table) will be used to identify what treatment at the marked crosswalk is recommended based on the roadway configuration, annual daily traffic (ADT), and the posted speed limit on the facility.

On roadway types with lower speed limits and lower volumes, the risk is reduced and a crosswalk without other improvements is recommended as indicated with a Green Circle with the letter C in it. As the ADT increases and speed increases, a crosswalk with other improvements are recommended, as shown by the Yellow Circle with the letter P. The Pedestrian Crossing Toolkit provides more specific types of crosswalks and other improvements that are possible. As speeds and the ADT increase even more, where the risk is high of serious injury, there are locations where a marked crosswalk is not sufficient unless a signal or a major improvement is implemented at the location, these instances are identified with the red circle with the letter N.

Table 3. Crosswalk Design by Roadway Type

ROADWAY CONFIGURATION	VEHICLE ADT	< 2,000			2000 - 9,000				9,000-12,000				12,000-15,000				> 15,000			
	MPH	≤ 25	30	35	≤ 25	30	35	40 +	≤ 25	30	35	40 +	≤ 25	30	35	40 +	≤ 25	30	35	40 +
Two Lanes		C	C	C	C	C	C	N/A	C	C	C	N/A	C	C	C	N/A	C	C	N	N/A
Three Lanes with Raised Median		C	C	C	C	P	P	P	C	C	P	P	P	P	P	P	P	P	N	N
Three Lanes without Raised Median		C	C	C	C	P	P	P	C	C	P	N	P	P	P	N	P	P	N	N
MultiLane with Raised Median		N/A	N/A	N/A	C	P	P	P	C	C	P	N	P	P	P	N	N	N	N	N
MultiLane without Raised Median		N/A	N/A	N/A	C	P	P	N	P	P	P	N	N	N	N	N	N	N	N	N

- C Crosswalk
- P Possible Crosswalk with Implementation of Other Improvements
- N Not Sufficient for Crosswalk without Signal or Substantial Improvement

Exceptions to Criteria

There may be cases where it is reasonable to allow exceptions to the criteria and these will be determined by the City Traffic Engineer . If the engineer anticipates that a location may meet the 20 pedestrians per hour requirement, the above procedure does not preclude counts from being collected. Engineering judgment is to be exercised in all situations. There will be locations that should or should not be marked due to other factors including frequency of marked crosswalks along a corridor and other corridor characteristics.

Marked Crosswalk Implementation

These guidelines establish the standard process for installing a marked crosswalk on a city-owned and -maintained street. Consistent with City Code Section 21-41, Adoption of standards and specifications, and Section 21-3, Standards and specifications, these guidelines are adopted as standard guidelines will be published and enforced by the Director of the Department of Public Works.



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