



ARLINGTON  
VIRGINIA

**DEPARTMENT OF ENVIRONMENTAL SERVICES**

**ARLINGTON COUNTY**

**Marked Crosswalk Guidelines**

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## TABLE OF CONTENTS

<b>General .....</b>	<b>1</b>
Description .....	1
Related Standards & Specifications .....	1
Submittals .....	1
<b>Design Criteria .....</b>	<b>2</b>
Definition .....	2
Purpose.....	2
<b>Establishing Crosswalks with Markings and/or Signage .....</b>	<b>2</b>
Signal Controlled Intersections.....	2
Stop Controlled Intersections.....	2
Mid-Block Locations .....	3
<b>Crosswalk Markings Styles .....</b>	<b>3</b>
<b>MUTCD Guidance.....</b>	<b>4</b>
<b>Pedestrian Safety on Multi-Lane Roads .....</b>	<b>4</b>
<b>Evaluation Criteria at Unsignalized Crossings .....</b>	<b>5</b>

## GENERAL

### *Description*

This document contains the guidelines and procedures used for the design and installation of crosswalks in Arlington County. The development of these guidelines is meant to provide greater guidance in identifying crossing locations that would benefit from crosswalk markings to meet the County's guiding principles to increase pedestrian safety and accessibility, while maximizing County resources and balancing the use of the Right-of-Way between all modes of transportation.

These guidelines are based on nationwide best practices regarding the marking of crosswalks. In the Commonwealth of Virginia, crosswalks exist whenever sidewalks extend across a street at an intersection. Marked crosswalks are indicated by lines or other markings on the surface of the roadway, which may be supplemented by contrasting pavement texture, style, or color.

The intent of this document is to establish guidance procedures for Engineers, Consultants, Planners, and Designers working within Arlington County.

### *Related Standards & Specifications*

- A. Manual of Uniform Traffic Control Devices (MUTCD)
- B. Code of Virginia
- C. Arlington County Horizontal Design Standards H-3.7
- D. Arlington County Master Transportation Plan – Pedestrian Element
- E. Arlington County Construction Standards & Specifications

### *Submittals*

Design and placement of all crosswalks on County roadways shall be approved by the Department of Environmental Services (DES) Transportation and Operations Bureau (TE&O).

## DESIGN CRITERIA

### *Definition*

A crosswalk is a portion of a roadway at an intersection or elsewhere designated for pedestrian crossing; whether marked or unmarked, flush or raised. Marked crosswalks are indicated by lines or other markings on the surface of the roadway. Unmarked crosswalks are the natural extension of the shoulder, curb line or sidewalk.

### *Purpose*

The primary purpose of a marked crosswalk is to heighten drivers' awareness of crossing pedestrians at intersections or mid-block locations. At non-intersection locations, crosswalk markings legally establish the preferred crossing path. Crosswalks serve to provide visual and tactile directional guidance to pedestrians when crossing the street and alert road users of a designated location where they can expect pedestrians to cross the roadway.

## ESTABLISHING CROSSWALKS WITH MARKINGS AND/OR SIGNAGE

The following guidance on where to mark crosswalks pertains to intersections and roadways maintained by Arlington County. If the subject crossing is situated on a roadway or intersection that is maintained by the Virginia Department of Transportation (VDOT), then it is their discretion whether to mark or not mark a crosswalk, although the County is willing to review the location and submit its recommendation to VDOT. In locations where a marked crosswalk is justified and curb & gutter is present, ADA (Americans with Disabilities Act of 1990) compliant curb ramps shall be provided on both sides of the proposed marked crosswalk. In the event that one or both of the existing curb ramps serving the subject proposed marked crosswalk are not ADA compliant; they shall be replaced with a new ramp(s) that meets the latest ADA standards per [Arlington County Horizontal Design Standards H-3.2 – Curb Ramps](#).

### *Signal Controlled Intersections*

Crosswalks shall be marked with high-visibility style continental crosswalk markings (refer to Figure 1) at all intersections and mid-block crossings controlled by traffic signals or flashing beacons. Generally, a crosswalk should be marked across each intersection approach, except in rare instances where pedestrian travel is prohibited across one or multiple intersection approaches. At T-intersections based on the Engineer's discretion, one crosswalk can be provided crossing the mainline street instead of the typical two crosswalks in order to reduce the potential for left turn conflicts with crossing pedestrians. Crosswalk warning signage (e.g. signs W11-2 or S1-1) shall not be posted at signalized intersections with the exception of intersections equipped with HAWK beacons.

### *Stop Controlled Intersections*

At traditional two-way stop or all-way stop controlled intersections, follow the *Crosswalk Marking Evaluation Matrix* flowchart found in Figure 3 on page 6 and the *Uncontrolled Crosswalk Treatments* table found in Table 1 on page 7 to determine whether a marked crosswalk is justified. If marked, crosswalks across stop or yield

approaches shall not be accompanied by any crosswalk warning signage. Such signs would be repetitive and may lead to driver confusion.

### Mid-Block Locations

At mid-block locations, follow the *Crosswalk Marking Evaluation Matrix* flowchart found in Figure 3 on page 6 and the *Uncontrolled Crosswalk Treatments* table found in Table 1 on page 7 to determine whether a marked crosswalk is justified at that location. If a marked crosswalk is justified at a mid-block location, crosswalk warning signs (W11-2) with the supplemental diagonal downward pointing arrow (W16-7P) plaque shall be posted at the location of the crosswalk.

## CROSSWALK MARKINGS STYLES

Throughout Arlington County, crosswalks are predominately installed using the continental style markings and the “standard” parallel line style markings illustrated in Figure 1. Although there are instances of ladder, dashed, and decorative brick imprint crosswalks found throughout the County, these styles are no longer being used.

**Figure 1: Different Styles of Crosswalk Markings**



All newly installed or re-marked crosswalks in the County shall use the continental style marking pattern (high-visibility) as referenced in this document. Exceptions to this standard include:

- Use of the parallel style “standard” crosswalk marking pattern when:
  - Re-marking existing crosswalks of this style, unless it is at the engineer’s discretion to upgrade the parallel style crosswalk to continental style markings;
  - Marking minor-street approach (ADT < 1,500 vehicles per day) crossings along busy arterials at unsignalized intersections; and
  - Installing crosswalks at locations that don’t satisfy the crosswalk marking pedestrian crossing volume criteria shown in Figure 3, however there is still a need to direct pedestrians along the proper crossing path (i.e. a very skewed crossing or a crossing that has one end situated in a driveway or level grassy area).
- The ladder style crossing marking pattern should only occur by default when:
  - Upgrading a crosswalk currently marked with the parallel style “standard” crosswalk marking pattern to the high-visibility (continental) style markings in a location that is not being re-paved. In this case, the existing two parallel crosswalk lines should not be eradicated due to the damage that would be caused to the pavement/walking surface. It is preferable to let the two parallel crosswalk lines fade away over time.

Refer to the [Arlington County Pavement Marking Specifications](#) for more detailed information on the width, spacing, and material of the crosswalk markings.

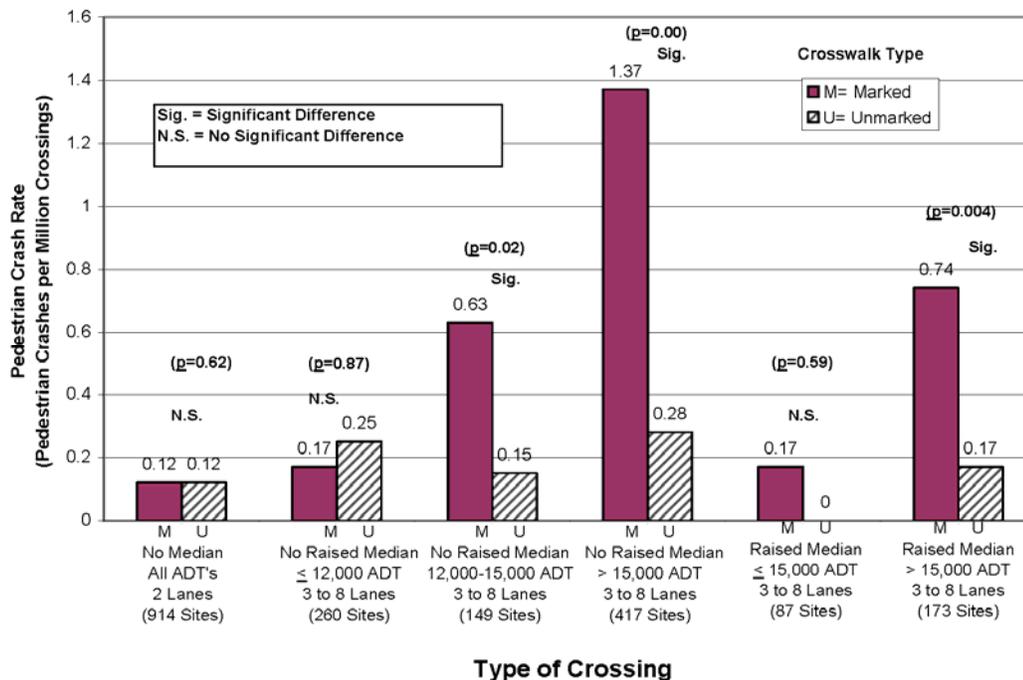
### MUTCD GUIDANCE

According to Section 3B.18 of the 2009 edition of the MUTCD, “crosswalk lines should not be used indiscriminately”. The MUTCD advises that on roadways where the speed limit exceeds 40 miles per hour (mph), in addition to marked crosswalks, other measures designed to reduce traffic speeds, shorten crossing distances, enhance driver awareness of the crossing, and/or provide active warning of pedestrian presence should be considered. This applies to uncontrolled crossings across roadways where the speed limit exceeds 40 mph and either: the roadway has four or more lanes of travel without a raised median or pedestrian refuge island and an ADT of 12,000 vehicles per day (vpd) or greater; or the roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vpd or greater.

### PEDESTRIAN SAFETY ON MULTI-LANE ROADS

The Federal Highway Administration (FHWA) published a final report and recommended guidelines on marking crosswalks in their September 2005 report titled [Safety Effects of Marked Versus Unmarked Crosswalk at Uncontrolled Locations](#). As illustrated in Figure 2, their study determined that the pedestrian crash rate was much higher at marked crosswalks than at unmarked crosswalks on certain types of facilities when traffic volumes are over 15,000 vpd, or over 12,000 vpd on multilane facilities without a raised median. Based on the results and recommendations made in this study, several jurisdictions nationwide responded by adopting their own crosswalk marking guidelines. They found that indiscriminately marking crosswalks at uncontrolled, multi-lane locations without guidance resulted in unexpected higher pedestrian exposure to conflicts than at unmarked crosswalks.

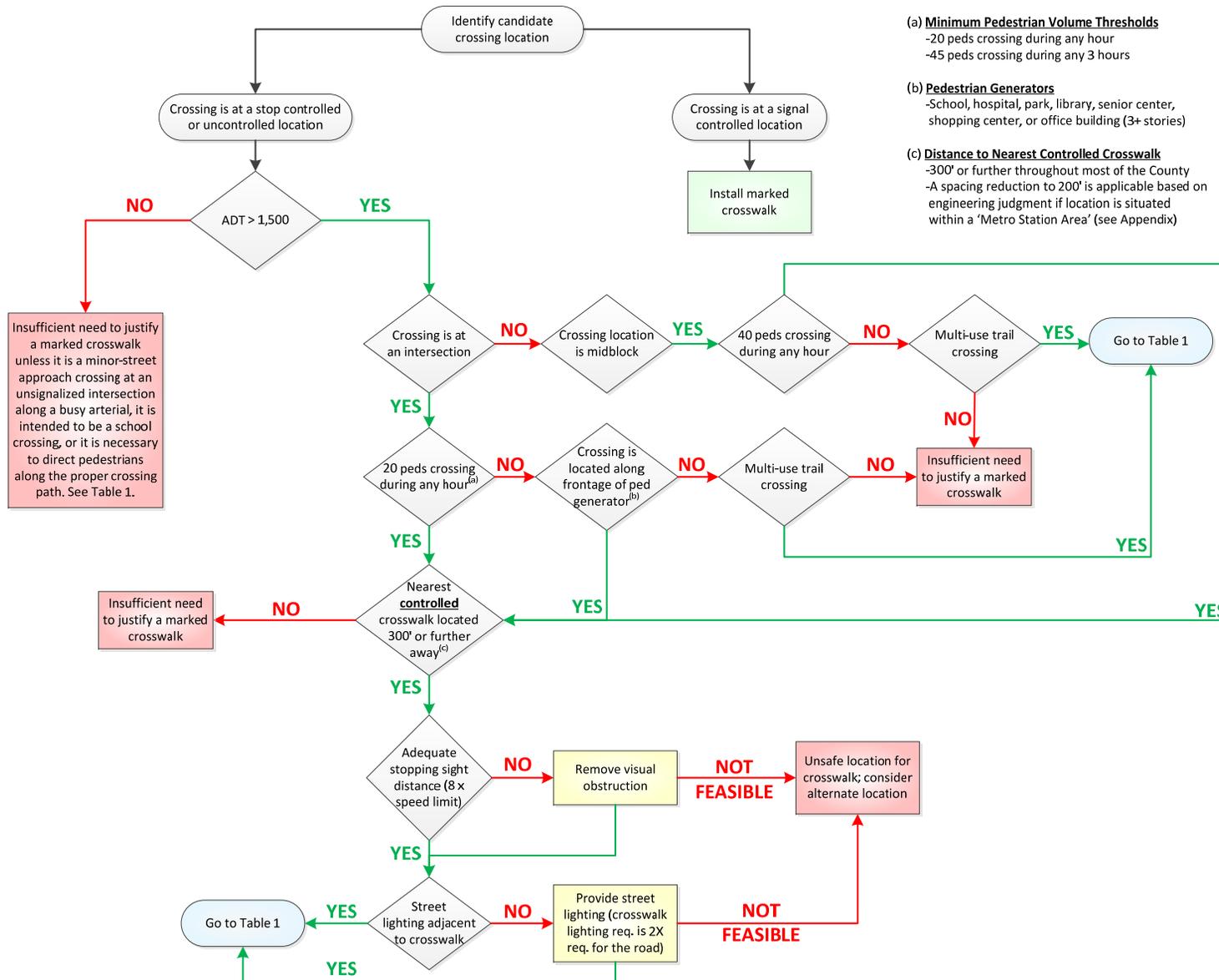
**Figure 2: Pedestrian Crash Rate Versus Type of Crossing**



## EVALUATION CRITERIA AT UNSIGNALIZED CROSSINGS

Many of the quantifiable thresholds found in the *Crosswalk Marking Evaluation Matrix* flowchart (refer to Figure 3) were generally established from a literature review of national crosswalk marking guidance, best practices, as well as policies implemented in the Commonwealth of Virginia (VDOT) and the following walkable localities: Washington DC (DDOT), San Francisco (SFMTA), Seattle (SDOT), and Boulder (City of Boulder, CO). The recommended uncontrolled crosswalk treatments shown in Table 1 are also based on similar recommendation tables from the five aforementioned states and localities, derived from Table 11 - Recommendations for installing marked crosswalks and other needed pedestrian improvements at uncontrolled locations (FHWA Study, page 54 - see Appendix). Table 1 was adjusted to account for the MUTCD guidance on crosswalk markings, which was issued four years after the FHWA study was published. The MUTCD deemed uncontrolled marked crosswalks allowable under certain conditions along median divided four-lane and wider roadways with speed limits of 40 mph or higher as long as the ADT is under 15,000 vpd. Furthermore, note that there are no roadways controlled by Arlington County with posted speed limits of 40 mph or higher. Information regarding the crosswalk marking guidelines used in the five previously mentioned states and localities is included in the Appendix.

Figure 3: Crosswalk Marking Evaluation Matrix



(a) **Minimum Pedestrian Volume Thresholds**

- 20 peds crossing during any hour
- 45 peds crossing during any 3 hours

(b) **Pedestrian Generators**

- School, hospital, park, library, senior center, shopping center, or office building (3+ stories)

(c) **Distance to Nearest Controlled Crosswalk**

- 300' or further throughout most of the County
- A spacing reduction to 200' is applicable based on engineering judgment if location is situated within a 'Metro Station Area' (see Appendix)

**Table 1: Uncontrolled Crosswalk Treatments**

Roadway Configuration	Roadway ADT & Posted Speed Limit											
	1,500 to 9,000 vpd			9,000 to 12,000 vpd			12,000 to 15,000 vpd			> 15,000 vpd		
	≤ 30 mph	35 mph	40 mph	≤ 30 mph	35 mph	40 mph	≤ 30 mph	35 mph	40 mph	≤ 30 mph	35 mph	40 mph
2 Lanes (two-way street)	A	B	C	A	B	C	A	B	C	B	C	E
2 Lanes (one-way street)	A	B	C	B	B	C	B	B	C	B	C	E
3 Lanes w/ raised median <sup>1</sup>	A	A	C	A	C	D	B	C	D	C	D	E
3 Lanes, no median	A	A	D	C	C	D	C	D	D	C	D	E
4 Lanes w/ raised median <sup>1</sup>	A	A	D	A	C	D	C	C	D	D	D	E
4 lanes, no median	A	D	E	C	D	E	D	E	E	E	E	E
5 Lanes w/ raised median <sup>1</sup>	A	A	D	A	C	E	D	D	E	D	E	E
5 lanes, no median	A	D	E	C	D	E	E	E	E	E	E	E
6 Lanes w/ raised median <sup>1</sup>	A	A	D	A	C	E	D	D	E	E	E	E
6 lanes, no median	A	D	E	C	D	E	E	E	E	E	E	E

<sup>1</sup> The raised median or refuge island must be at least 6 feet wide to adequately serve as refuge area for pedestrians.

Treatment Descriptions:

Volumes below 1,500 vpd

Install “standard” parallel style crosswalk markings. These should only be used to re-mark existing crosswalks of this style, to mark minor-street approach crossings along busy arterials at unsignalized intersections, or when it is necessary to direct pedestrians along the proper crossing path. Use Treatment A for school crossings.

**Treatment A**

Install high-visibility style (continental) crosswalk markings with road-side W11-2 (S1-1 for school crossings) and W16-7P pedestrian crossing warning signage placed at the crosswalk location.

**Treatment B**

Same as A, but in addition install advance road-side W11-2 and W16-9P warning signage and in-roadway R1-6 bollards (except on one-way streets).

**Treatment C**

Same as B, but in addition install yield lines and sign R1-5 both placed 20’ to 50’ in advance of the crosswalk marking. If applicable and feasible, install curb extensions (bulb-outs) and median refuge islands.

**Treatment D**

Same as C, but in addition install road-side pedestrian activated Rectangular Rapid Flashing Beacons (RRFB).

**Treatment E**

**Do not install marked crosswalk.** Consider HAWK beacon, pedestrian traffic signal, road-diet, or grade-separated crossing.