City of Columbia

701 East Broadway, Columbia, Missouri 65201

Agenda Item Number: PR 119-14
Department Source: Public Works
To: City Council
From: City Manager & Staff
Council Meeting Date: July 7, 2014
Re: Policy Resolution Establishing Guidelines for Pedestrian Crossings

Documents Included With This Agenda Item

Council memo, Resolution/Ordinance
Supporting documentation includes: Diagrams, Copy of Policy Resolution 134-00A, MUTCD guidelines for pedestrian crossings

Executive Summary

Staff is proposing to repeal Policy Resolution 134-00A, which established a Policy and Standards for Pedestrian Crossings in 2000. This document is outdated and conflicts with the Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD).

Discussion

The City's current Policy and Standards for Pedestrian Crossings was adopted in 2000 per Policy Resolution 134-00A. At that time there was minimal guidance offered in the MUTCD with regard to pedestrian crossings; however, over the last several years the MUTCD has undergone three major revisions with significant focus on pedestrian markings. The City's current policy is outdated, and in order to reflect consistent industry practices utilizing the MUTCD's guidelines for pedestrian crossings, staff recommends the repeal of the 2000 Policy Resolution. In addition, Section 14-462 of the Code of Ordinances establishes that all traffic control signs, signals and devices shall conform to the manual and specifications approved by the state highway commission. Staff has attached the specific pages of the manual that relate to pedestrian crossings; however, the entire manual can ve viewed at: http://mutcd.fhwa.dot.gov/pdfs/2009r1r2/mutcd2009r1r2edition.pdf.

Fiscal Impact

Short-Term Impact: None
Long-Term Impact: None

Vision, Strategic & Comprehensive Plan Impact

Vision Impact: Transportation
Strategic Plan Impact: Infrastructure
Comprehensive Plan Impact: Infrastructure

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Suggested Council Action

Repeal Policy Resolution 134-00A which established the Policy and Standards for Pedestrian Crossings.

Legislative History

10/16/00 - (PR134-00A) Policy Resolution establishing a policy and standards for pedestrian crossings.

Department Approved

City Manager Approved

Introduced by _____ Council Bill No. _____PR 119-14_____

A POLICY RESOLUTION

repealing Policy Resolution No. 134-00 A which established a Policy and Standards for Pedestrian Crossings.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. Policy Resolution No. 134-00 A adopted on October 16, 2000, which established a Policy and Standards for Pedestrian Crossings, is hereby repealed.

ADOPTED this _____ day of _____, 2014.

ATTEST:

_____ _____

City Clerk Mayor and Presiding Officer

APPROVED AS TO FORM:

_____

City Counselor

City of Columbia
701 East Broadway, Columbia, Missouri 65201

SUPPORTING DOCUMENTS INCLUDED WITH
THIS AGENDA ITEM ARE AS FOLLOWS:

Diagrams, Copy of Policy Resolution 134-00A, MUTCD Guidelines for pedestrian crossings

Old Sign

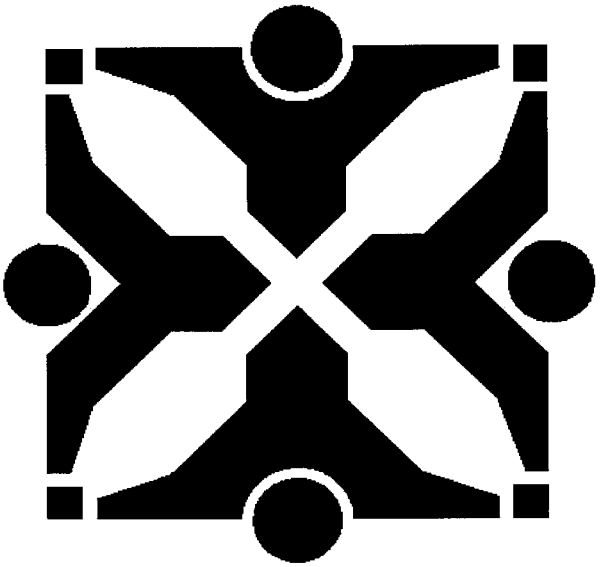
Was placed in advance of high pedestrian intersections, mid-block crossings, and school zones. Placed at edge of road.

New Sign

Placed in advance of high pedestrian intersections, mid-block crossings, and school zones. Placed in Pavement.

10/30/00

POLICY AND STANDARDS FOR PEDESTRIAN CROSSINGS



City of Columbia, Missouri

Policy Resolution 134-00

Policy and Standards for Pedestrian Crossings

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I. Mission Statement

Public Works Department Pedestrian Crossing Mission:

It shall be the mission of the Public Works Department to provide for pedestrian crossings of public streets in such manner to increase the safety of pedestrian users and encourage pedestrian traffic in accordance with the concepts of a walkable community.

II. General

A. Residential Streets

Speeds and volumes on residential streets should be lower than on higher classification streets and should not normally require pavement markings or signs to indicate crosswalks. Requests for crosswalks on these streets may be an indication of other traffic concerns which can be determined by a traffic study. Based on a traffic study, crosswalk markings or other appropriate measures such as traffic calming may be implemented.

B. Mid-block Crossings

A mid-block crosswalk is defined as a crosswalk at a location other than an intersection. State and City laws require motorists to yield to pedestrians in crosswalks. Mid-block crosswalks can be used to improve safety for pedestrians crossing at a specific location. To be effective at improving safety, a mid-block crosswalk should be installed at specific locations where pedestrians would be expected to need to cross the street. If the pedestrian crossings are occurring at random locations within a block and if vehicle volumes are low or moderate (adequate gaps are available) it is likely that most pedestrians will not alter their route by more than a few yards to use the crosswalk. Consideration should be given to the safety of all pedestrians (younger and older pedestrians) who may use a proposed mid-block crosswalk.

Crosswalk locations must allow motorists to safely yield for pedestrians. Sight distance, roadway geometrics and the potential for rear-end type accidents should be evaluated. Streets with two traffic lanes in the same direction present a potential hazard when a vehicle in one lane yields to a pedestrian and obstructs the sight line of the pedestrian for a motorist in the other lane.

The safety of mid-block crosswalks is dependent on the judgement of the pedestrian and the motorist. Engineering standards can help by making crosswalks more visible. Warrant criteria can help by making sure that crosswalks are installed at safe locations. Enforcement of crosswalk laws is very important to improve safety.

C. Major Intersections

A major intersection is defined as an intersection of two streets of collector or higher classification, and intersections within the Central Business District. Intersections of minor streets with streets on the Major Thoroughfare Plan may be studied like major intersections if the Bicycle and Pedestrian Commission

identifies them as desirable crossing locations. Pedestrian exposure to vehicles is increased when vehicle volumes increase. Collector streets and higher classification streets generally carry higher volumes than local residential streets. Chapter 14, Article X of the Columbia Code indicates that pedestrians have the right of way within marked crosswalks and at unmarked crosswalks at intersections. At major intersections, crosswalk markings can provide increased awareness of the presence of pedestrians. Major intersections with all-way stop control and signalized intersections will generally be provided with marked crosswalks. There are three levels of crosswalk markings, standard, enhanced standard, and special emphasis. The highest levels of marking, should be reserved for situations where the pedestrian exposure is the greatest. The level of markings used should be similar for similar conditions to encourage driver familiarity.

D. Traffic Engineering Study

A traffic engineering study is required to determine if the criteria and warrants are met for a marked crosswalk at a particular location, and to determine the level of marking justified. The level of detail required for a traffic engineering study will vary with the location under consideration.

The engineering study includes consideration of:

1. Speed and traffic volume data on streets being crossed
2. Pedestrian volume, age, and level of mobility
3. Location of pedestrian origin and destination points and crossing pattern
4. Existing sidewalk network and sidewalk ramps
5. Sight distances and sight obstructions
6. Street characteristics including grades, curvature, pavement widths, and number of vehicle and bicycle lanes
7. Location of adjacent driveways
8. On-street parking
9. Street lighting
10. Location of drainage structures
11. Distance to nearest protected or marked crossing
12. Traffic signal progression
13. Potential for rear end accidents

E. Maintenance

Crosswalks markings and signs shall be maintained in a high state of visibility and must meet reflectivity standards. All crosswalk markings and signs must be inspected at least twice a year and replaced as needed.

School zone markings and signs must be inspected prior to the beginning of the school year in late summer and re-painted as needed.

III. Warrants and Guidelines for Pedestrian Crossings

A. General

Marked crosswalks are intended to provide pedestrians with a feeling of confidence that it is safe to cross a street at the marked location and to give motorists adequate warning to expect pedestrians to be in the roadway. They are also to encourage pedestrians to cross roadways where there are adequate facilities to accomplish these purposes. Care should be taken to insure that marking crosswalks at some locations does not detract from other similar locations without markings. A Traffic Engineering Study as described in section II. D. is required when evaluating a location for marked crosswalks.

The following are general criteria to be satisfied in addition to the warrant criteria when considering installation of marked crosswalks:

1. Marked crosswalks must connect to established sidewalks at both ends.

2. ADA accessible ramps shall be included at both ends of crosswalk installations unless there are engineering reasons they cannot be provided.

3. Adequate street lighting must be provided for the safety of pedestrians.

4. Street parking must be restricted adjacent to crosswalks to allow for adequate sight lines for both the motorists and the pedestrians. The length of the parking restriction shall be based on an engineering study.

B. Residential Streets

Marked crosswalks will generally not be installed on residential streets. Marked crosswalks will be evaluated for use on residential streets when indicated by one or more of the following:

1. The street intersects with a collector or higher classification street and the average daily traffic volume on the minor street exceeds 1000 vehicles per day.

2. The crossing location is within a designated school zone or is a key element of a designated school walking route plan.

3. A traffic engineering study indicates a safety problem that can be addressed by a marked crosswalk.

Evaluation of marking a crosswalk on a residential street requires an engineering traffic study and satisfying the requirements of III. A.

C. Mid-block Crossings

1. Warrant Criteria

A crosswalk at a mid-block location may be installed when the location satisfies the general criteria of III. A. and meets all of the warrant criteria for a mid-block crosswalk listed below:

a. The crossing volume is not caused by a correctable gap in the sidewalk system.

b. There is minimum distance of 300 feet to nearest protected crossing. A protected crossing is a crossing controlled by stop signs or signals or at a grade separation.

c. Engineering study indicates no unsafe visibility or site conditions would be created.

d. Posted speed is 35 mph or less.

e. On an average day, a minimum of 50 pedestrians cross the street within 50 feet of the proposed crossing, during any one hour.

f. The average daily two-way traffic volume on the street is above 3500 vehicles per day or there are insufficient normal gaps in traffic to allow pedestrian crossing at an average walking speed of 3.5 mph within a three minute interval more than twice during any peak hour period.

When a mid-block crosswalk is warranted the following guidelines shall be used:

- Level 3 markings shall be used
- "Yield to pedestrians" signs shall be placed in advance
- Crossing treatments as shown in Section IV. C. should be considered

2. Exceptions to Warrant Criteria

The pedestrian volume and vehicle volume warrants may be waived for any of the following situations:

a. The crossing location is a key element of a designated school walking route plan

b. A traffic engineering study indicates a safety problem that can be addressed by a marked mid-block crosswalk.

c. The Bicycle and Pedestrian Commission has identified the location as a desirable location to

encourage crossing. Such locations can include, across collector and arterial streets where the distance to the nearest protected crossing or marked crossing is great enough that pedestrians would not logically be expected to use the protected or marked crossing, near transit stops, bike corridors, greenbelt and multi-use path crossings. The presence of pedestrians helps safety by reminding motorists of the crossing. Therefore, when the pedestrian volume is waived, additional emphasis should be given to installing crossing treatments as shown in Section IV. C.

D. Major Intersections

1. Un-signalized Intersections

a. All-way stop-controlled intersection

Provided the general criteria in Section III. A. is satisfied, all-way stop-controlled intersections shall use the following guidelines:

- At a minimum, crosswalks shall have Level 1 markings.
- Level 2 or 3 markings may be used based on crossing length, speed, and volumes.
- "Yield to pedestrians" signs may be placed in advance of all-way stop-controlled intersections.
- When crossing lengths are greater than 36 feet, pedestrian refuge islands shall be evaluated.

b. Partial stop-controlled intersection

Each approach at a partial stop-controlled intersection will be either **stop-controlled** or **uncontrolled**. Crosswalk markings at partial stop-controlled intersections will be evaluated based on the control of the approach being considered as indicated below. **Tee intersections** with heavy turning volumes and highly skewed intersections may require additional consideration.

i. Stop-controlled approaches

Provided the general criteria in Section III. A is satisfied, stop-controlled approaches shall use the following guidelines:

- At a minimum, crosswalks shall have Level 1 markings.
- Level 2 or 3 markings may be used based on crossing length, speed, and volumes
- "Yield to pedestrians" signs may be placed in advance of stop-controlled approaches at intersections.
- When crossing lengths are greater than 36 feet, pedestrian refuge islands shall be evaluated.

ii. Uncontrolled approach to intersection

This section applies to the uncontrolled approaches of partial stop-controlled intersections which are similar to a mid-block crosswalk in that the pedestrian is crossing uncontrolled traffic. The warrants for mid-block crosswalks, as stated in section III. C. 1 shall be used

when evaluating crosswalks across the uncontrolled approaches at an intersection, except that a 50% reduction pedestrian and vehicle volumes is permissible. The Pedestrian and vehicle volumes may be waived as indicated in Section III. C. 2. Provided the general criteria in Section III. A. is satisfied, and the modified mid-block warrants are satisfied, uncontrolled approaches shall use the following guidelines:

- Marked crosswalks on uncontrolled approaches of intersections shall be Level 3 markings.
- "Yield to pedestrians" signs should be placed in advance of crosswalks across uncontrolled approaches at intersections.
- Crossing treatments as shown in Section IV. C. should be considered.

2. Signalized Intersections

Provided the criteria in Section III. A. are satisfied, signalized intersections shall use the following guidelines:

- At a minimum, crosswalks shall have Level 1 markings.
- Level 2 or 3 markings may be used based on crossing length, vehicle speed and volumes.
- Signals shall provide enough time to allow pedestrians to cross the street safely based on a walking speed of 3.5 feet per second, this rate may be reduced at locations where the predominate walking speed is slower.
- Actuated signals should have pedestrian signals (WALK, DON'T WALK) activated by push buttons.
- When crossing lengths are greater than 36 feet, pedestrian refuge islands are to be evaluated.
- Pedestrian signals (WALK, DON'T WALK) shall be installed when the crosswalk crosses more than two lanes of same direction traffic or when the average daily entering traffic volume exceeds 10,000 vpd.

IV. STANDARDS

A. Pavement Markings

Crosswalks shall be a minimum of 6 feet or the same width as the approach walkway if the walkway is wider than 6 feet. When the guidelines and warrants section of this policy indicate the use of crosswalk markings, one of the following three levels of marking shall be used:

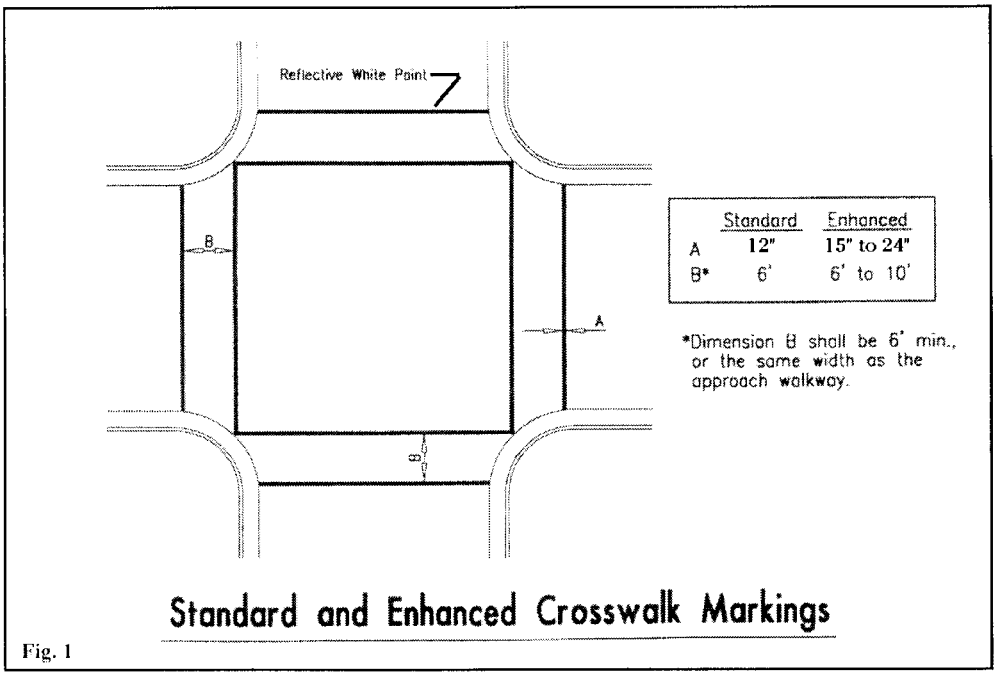


Figure 1 shows standard and enhanced crosswalk markings.

Level 1 - *Standard* crosswalk markings are two 12-inch white lines, 6 feet apart. (Fig. 1)

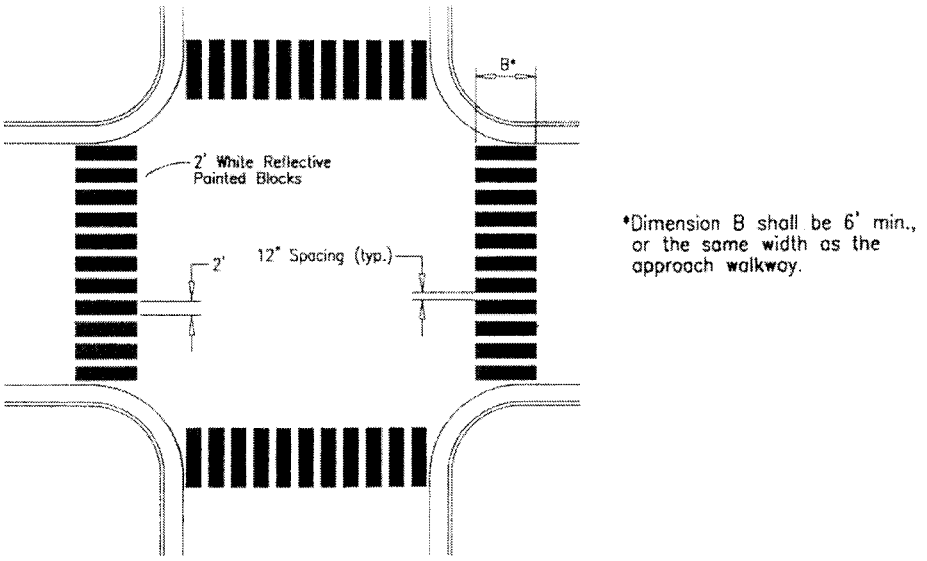
Level 2 - *Enhanced standard* crosswalk markings are similar to standard crosswalk markings except the width of the white lines is anywhere from 15 inches wide to 24 inches wide. (Fig. 1)

Enhanced standard markings may be used when any one of the following apply:

- Crosswalk is wider than 6 feet
- Crossing more than 2 lanes of traffic
- Intersection entering volume exceeds 900 vehicles per hour for any one hour
- "Yield to pedestrians" sign is placed in advance of crosswalk
- Across minor street at two-way stop controlled when major street speed limit exceeds 35 mph

Level 3 - *Special emphasis* crosswalk markings consist of white 2-foot wide bars with a 1-foot space at 90 degrees to the crosswalk. (Fig. 2) The width of the bars and spaces may be increased up to 36 inches at some locations to allow the tires of vehicles to track through the spaces.

Figure 2 shows special emphasis crosswalk markings.



Special Emphasis Crosswalk Markings

Fig. 2

Special Emphasis Markings **may** be used at any of the following locations:

- Within school zones or as shown on a school walking route plan
- When an engineering study indicates the need for additional visibility
- Where crosswalk treatments are used that result in raised pavements

Special Emphasis Markings **shall** be used at the following locations:

- Where mid-block crossings are installed
- Across un-controlled traffic at partial stop-controlled intersections
- Where crossings are installed on streets having an average daily traffic volume of 4000 vehicles per day or more.

High Pedestrian Areas - In business districts, campuses, commercial areas and other high pedestrian areas where pedestrian activity is to be encouraged and where significant distractions to motorists and pedestrians are likely to occur, engineering judgement can be used to implement a higher level of pavement marking than would be indicated by the crosswalk marking standards. Care should be taken to insure that special emphasis markings at some locations do not weaken or detract from other crosswalks where lower level markings are used.

B. Signs

1. **Crosswalk Signs - W11A-2** (Fig. 3)
   The W11A-2 sign shall be used at marked mid-block crosswalks. When a W11A-2 crosswalk sign is used, an M6-2 sign (Fig. 3) with an arrow pointing down at a 45 degree shall be used with the sign. This sign group shall be installed so that a motorist will see the signs on the left side as well as the right side of the crosswalk. Crosswalk signs (W11A-2) may also be mounted over traffic lanes on mast arms to increase awareness of the crossing location.

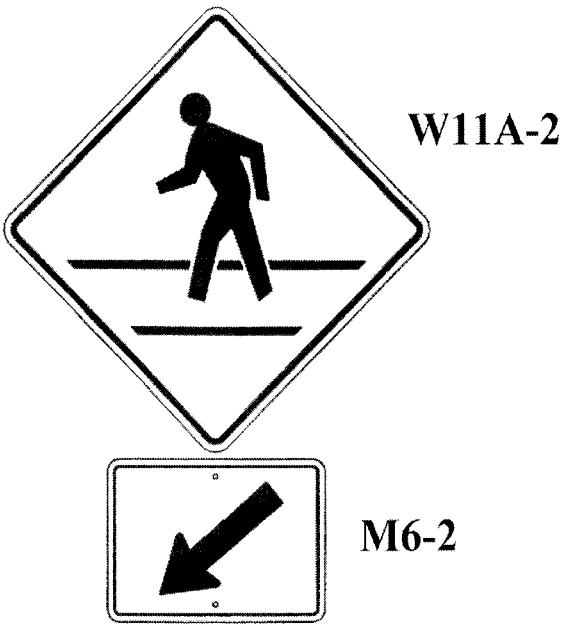


Fig. 3

Figure 3 shows the standard sign group for marking crosswalks.

2. **"Yield to Pedestrian" Signs (YTP)** (Fig. 4)
   To increase public awareness of the law requiring motorists to yield to pedestrians, a "Yield to Pedestrians - It's the Law" sign may be utilized in any of the following situations:
   - In advance of high pedestrian intersections
   - In advance of mid-block crossings
   - In advance of school zones

   When the YTP sign is used, crosswalk markings shall be Level 2 or Level 3.

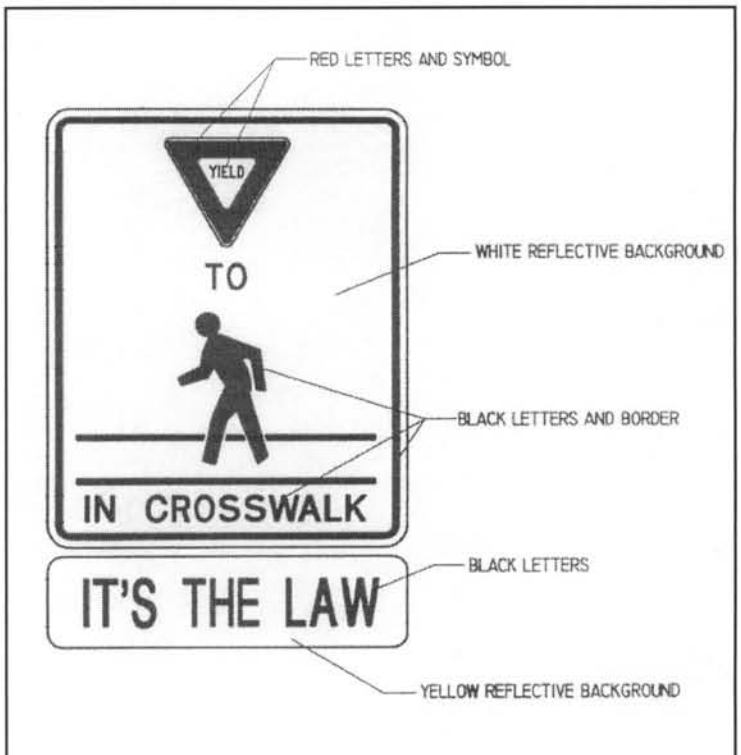


Fig. 4

Figure 4 shows the standard "Yield to Pedestrian Sign"

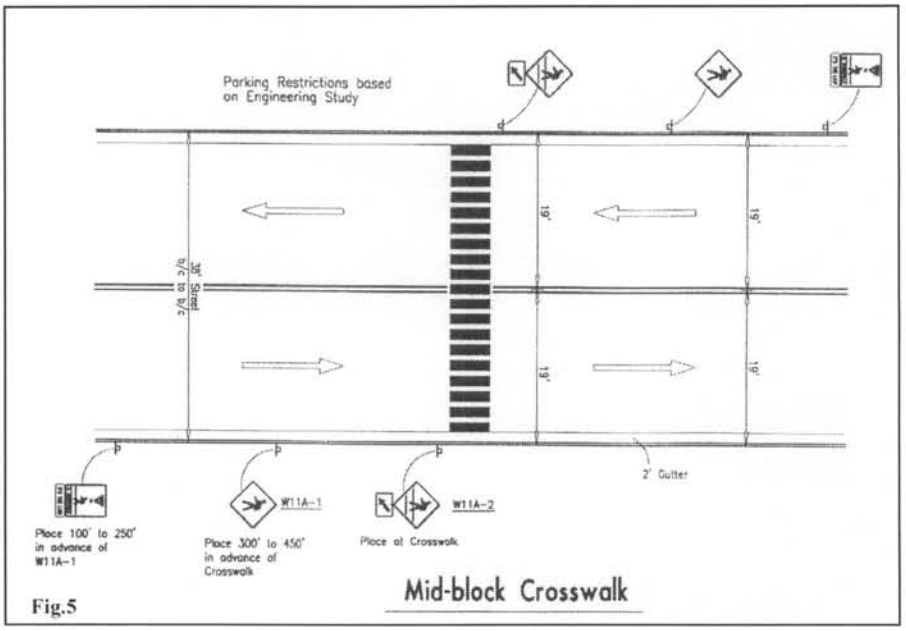


Fig.5

Figure 5 shows a typical mid-block crossing and the relationship of signs.

C. Crosswalk Treatments

The purpose of crosswalk treatments is to improve safety by:

- Reducing vehicle speed at the crosswalk
- Reducing exposure of the pedestrian to vehicles
- Increasing awareness of the presence of pedestrians
- Increasing visibility of the crosswalk

1. Bulb-Outs - Bulb-outs for pedestrians should be considered when warrants exist for pedestrian crossings at mid-block or major intersections and the pavement width is greater than 32 feet. Bulb-outs for traffic calming purposes may be installed on streets of lesser widths but are not considered necessary solely for pedestrian purposes. A typical mid-block crossing with bulb-outs is shown on Fig. 6. The illustration also indicates the location of signing.

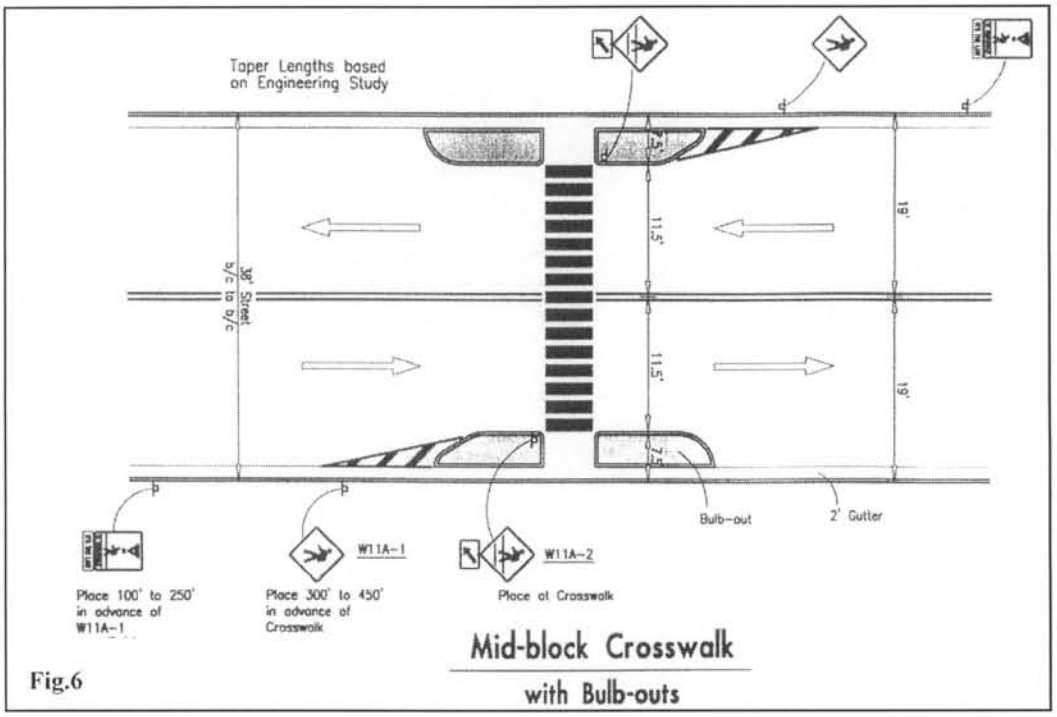


Fig.6

Figure 6 shows a typical mid-block crosswalk with bulb outs.

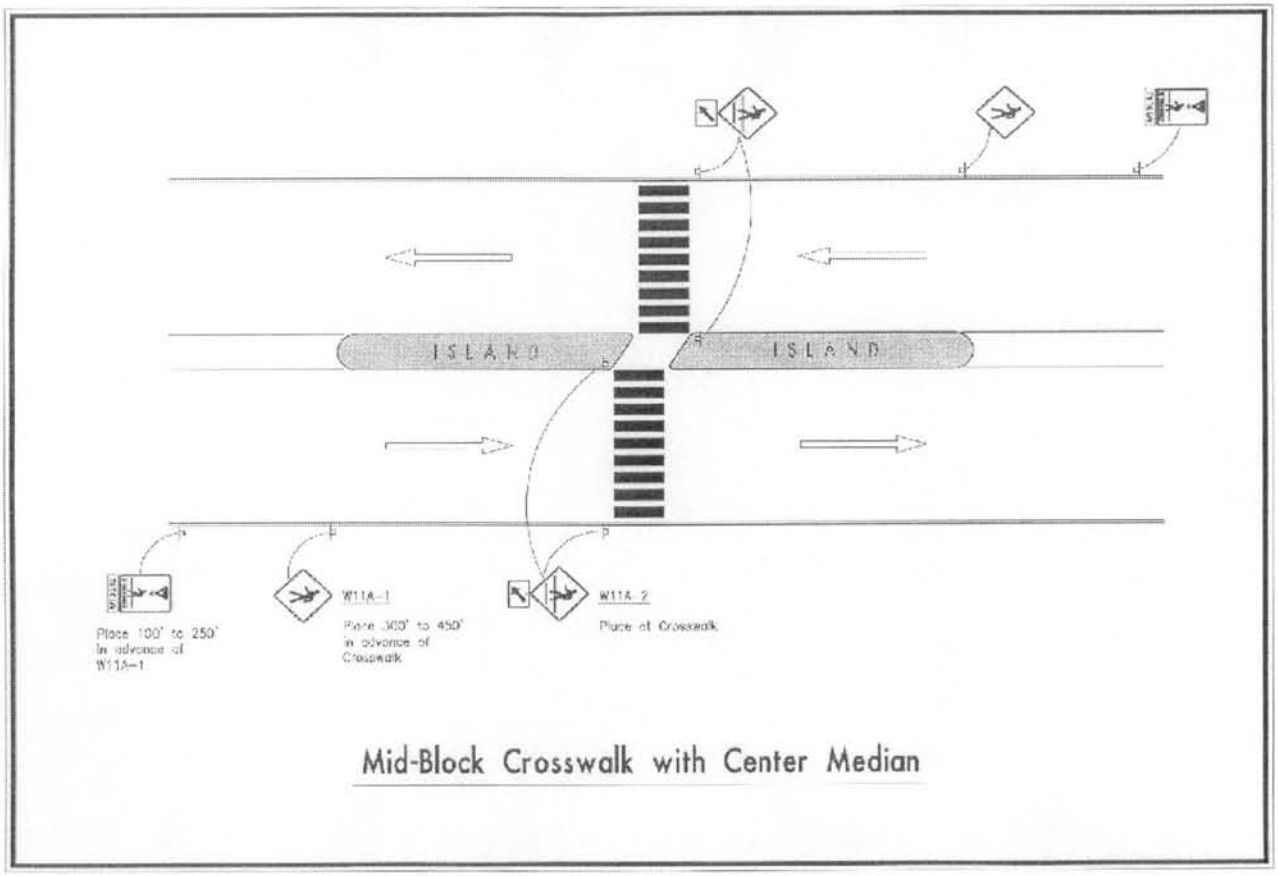


Figure 7 shows a typical mid-block crossing with a center median.

2. **Center Medians** - Center medians can improve crossing safety by providing a pedestrian refuge which will allow the pedestrian to cross each direction of traffic separately. Center medians shall only be installed where pavement widths are sufficient to allow for the safe clearance of pedestrians from moving traffic and the resulting traffic lanes are sufficient in width for the posted speed limit. Crosswalks leading to the center median will be offset to place emphasis on the median as a stopping place for pedestrians. A typical mid-block crossing with a pedestrian median and sign location is shown in Fig. 7. When a center median is used and there is also on street parking, bulb-outs may be considered in conjunction with the center median.

3. **Raised Crosswalks** - The intent of raised crosswalks is to increase visibility of the crosswalk and to decrease the vehicle speeds. Raised crosswalks are to be implemented as shown in the traffic calming policy.

4. **Flashing Yellow Crosswalk Lights** - Flashing yellow lights may be used at mid-block crosswalks if an engineering study indicates a need to increase awareness of the crosswalk location or the presence of pedestrians. Flashing yellow lights do not assign right-of-way. Improper interpretations of the purpose or meaning of flashing lights can lead to conflicting movements and should be considered when evaluating the use of flashing yellow lights.

For flashing yellow lights to be effective, they must command respect from motorists. If the lights flashed continually, a motorist would lose respect and ignore the installation after being "falsely warned" several times. Therefore, when flashing yellow lights are used at crosswalks, they should be activated by pedestrians.

Pedestrian actuated lights flash when a pedestrian pushes a button or passes a sensor. These lights indicate the presence of a pedestrian. The lights can be mounted with the crosswalk signs at the side of the road, over the driving lanes on mast arms, or in the pavement with airport taxiway style lights. For crossing multi-lane same direction traffic, overhead or in pavement lights are recommended.

5. **Pedestrian Warranted Traffic Signals** - Traffic signals can be installed at an intersection or mid-block based on pedestrian volumes if warranted by the Manual on Uniform Traffic Control Devices. (MUTCD) When traffic signals are installed based on pedestrian volumes, pedestrian signals must be used. (WALK, DON'T WALK)

6. **Grade Separation Structure** - Where it is not possible to accommodate pedestrians with at-grade crossings, grade separation may be considered. These facilities are expensive and can add out-of-direction travel. Therefore, grade separation should only be located where their use would be maximized. To ensure proper use, these facilities must be open, with good visibility and easily accessible.

7. **Supplemental Pedestrian Crossing Channelizing Devices (SPCCD)** - SPCCD are portable devices consisting of a standard "yield to pedestrians" sign attached to a light weight frame and stand. These devices are not currently contained in the MUTCD but can be effective for temporary use during peak pedestrian hours. The SPCCD must be manually set up on the street centerline and removed after the peak period. They are most useful at crossings with a crossing guard and typically are used at school crossings, campuses, and special events. The SPCCD should only be used at existing marked crosswalks.

Support:

10 Figure 2A-3 shows examples of some typical placements of STOP signs and YIELD signs.

11 Section 2A.16 contains additional information about separate and combined mounting of other signs with STOP or YIELD signs.

Guidance:

12 *Stop lines that are used to supplement a STOP sign should be located as described in Section 3B.16. Yield lines that are used to supplement a YIELD sign should be located as described in Section 3B.16.*

13 *Where there is a marked crosswalk at the intersection, the STOP sign should be installed in advance of the crosswalk line nearest to the approaching traffic.*

14 *Except at roundabouts, where there is a marked crosswalk at the intersection, the YIELD sign should be installed in advance of the crosswalk line nearest to the approaching traffic.*

15 *Where two roads intersect at an acute angle, the STOP or YIELD sign should be positioned at an angle, or shielded, so that the legend is out of view of traffic to which it does not apply.*

16 *If a raised splitter island is available on the left-hand side of a multi-lane roundabout approach, an additional YIELD sign should be placed on the left-hand side of the approach.*

Option:

17 If a raised splitter island is available on the left-hand side of a single lane roundabout approach, an additional YIELD sign may be placed on the left-hand side of the approach.

18 At wide-throat intersections or where two or more approach lanes of traffic exist on the signed approach, observance of the right-of-way control may be improved by the installation of an additional STOP or YIELD sign on the left-hand side of the road and/or the use of a stop or yield line. At channelized intersections or at divided roadways separated by a median, the additional STOP or YIELD sign may be placed on a channelizing island or in the median. An additional STOP or YIELD sign may also be placed overhead facing the approach at the intersection to improve observance of the right-of-way control.

Standard:

19 **More than one STOP sign or more than one YIELD sign shall not be placed on the same support facing in the same direction.**

Option:

20 For a yield-controlled channelized right-turn movement onto a roadway without an acceleration lane and for an entrance ramp onto a freeway or expressway without an acceleration lane, a NO MERGE AREA (W4-5P) supplemental plaque (see Section 2C.40) may be mounted below a Yield Ahead (W3-2) sign and/or below a YIELD (R1-2) sign when engineering judgment indicates that road users would expect an acceleration lane to be present.

Section 2B.11 Yield Here To Pedestrians Signs and Stop Here For Pedestrians Signs (R1-5 Series)

Standard:

01 **Yield Here To (Stop Here For) Pedestrians (R1-5, R1-5a, R1-5b, or R1-5c) signs (see Figure 2B-2) shall be used if yield (stop) lines are used in advance of a marked crosswalk that crosses an uncontrolled multi-lane approach. The Stop Here for Pedestrians signs shall only be used where the law specifically requires that a driver must stop for a pedestrian in a crosswalk. The legend STATE LAW may be displayed at the top of the R1-5, R1-5a, R1-5b, and R1-5c signs, if applicable.**

Guidance:

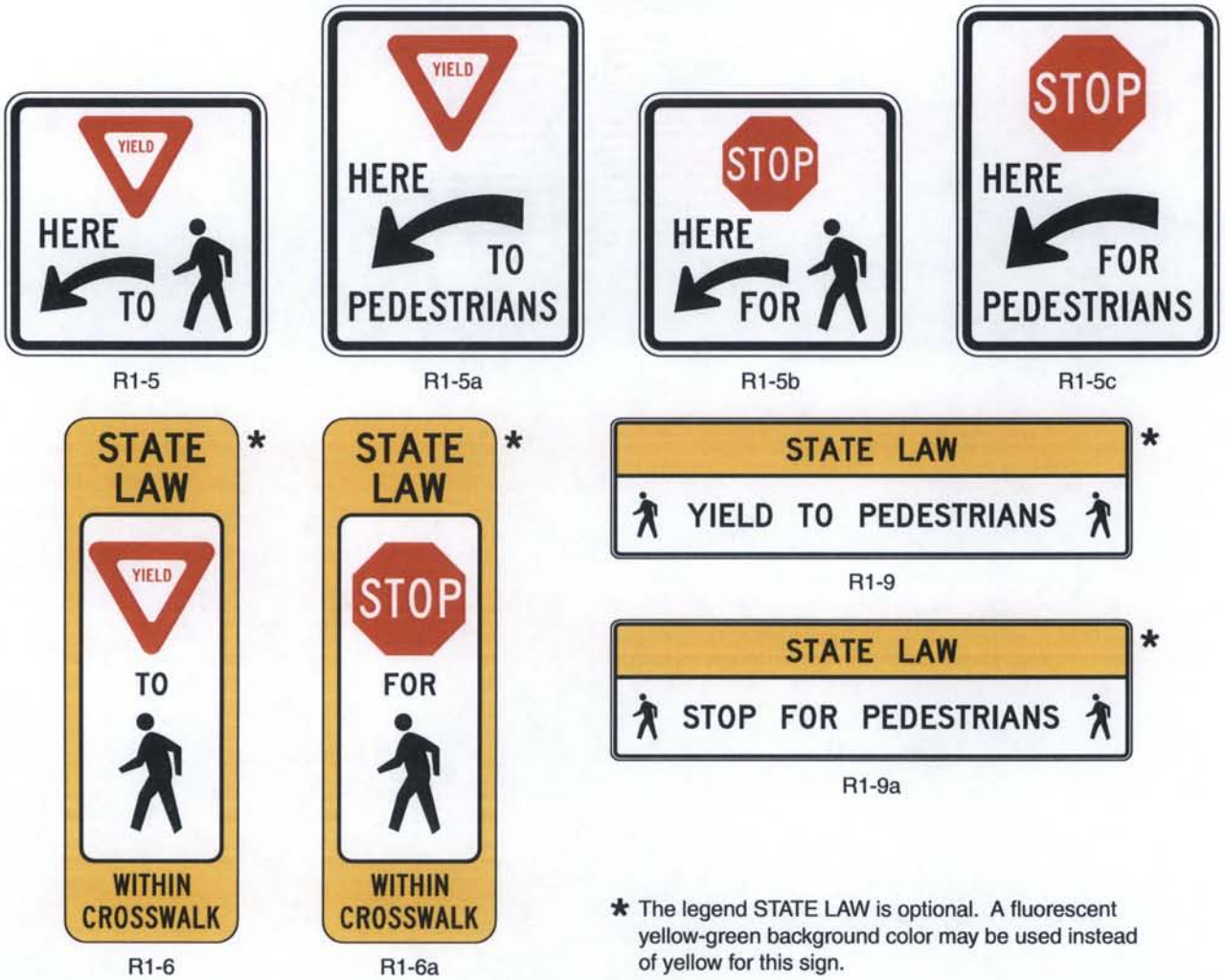
02 *If yield (stop) lines and Yield Here To (Stop Here For) Pedestrians signs are used in advance of a crosswalk that crosses an uncontrolled multi-lane approach, they should be placed 20 to 50 feet in advance of the nearest crosswalk line (see Section 3B.16 and Figure 3B-17), and parking should be prohibited in the area between the yield (stop) line and the crosswalk.*

03 *Yield (stop) lines and Yield Here To (Stop Here For) Pedestrians signs should not be used in advance of crosswalks that cross an approach to or departure from a roundabout.*

Option:

04 Yield Here To (Stop Here For) Pedestrians signs may be used in advance of a crosswalk that crosses an uncontrolled multi-lane approach to indicate to road users where to yield (stop) even if yield (stop) lines are not used.

Figure 2B-2. Unsignalized Pedestrian Crosswalk Signs



05 A Pedestrian Crossing (W11-2) warning sign may be placed overhead or may be post-mounted with a diagonal downward pointing arrow (W16-7P) plaque at the crosswalk location where Yield Here To (Stop Here For) Pedestrians signs have been installed in advance of the crosswalk.

Standard:

06 **If a W11-2 sign has been post-mounted at the crosswalk location where a Yield Here To (Stop Here For) Pedestrians sign is used on the approach, the Yield Here To (Stop Here For) Pedestrians sign shall not be placed on the same post as or block the road user's view of the W11-2 sign.**

Option:

07 An advance Pedestrian Crossing (W11-2) warning sign with an AHEAD or a distance supplemental plaque may be used in conjunction with a Yield Here To (Stop Here For) Pedestrians sign on the approach to the same crosswalk.

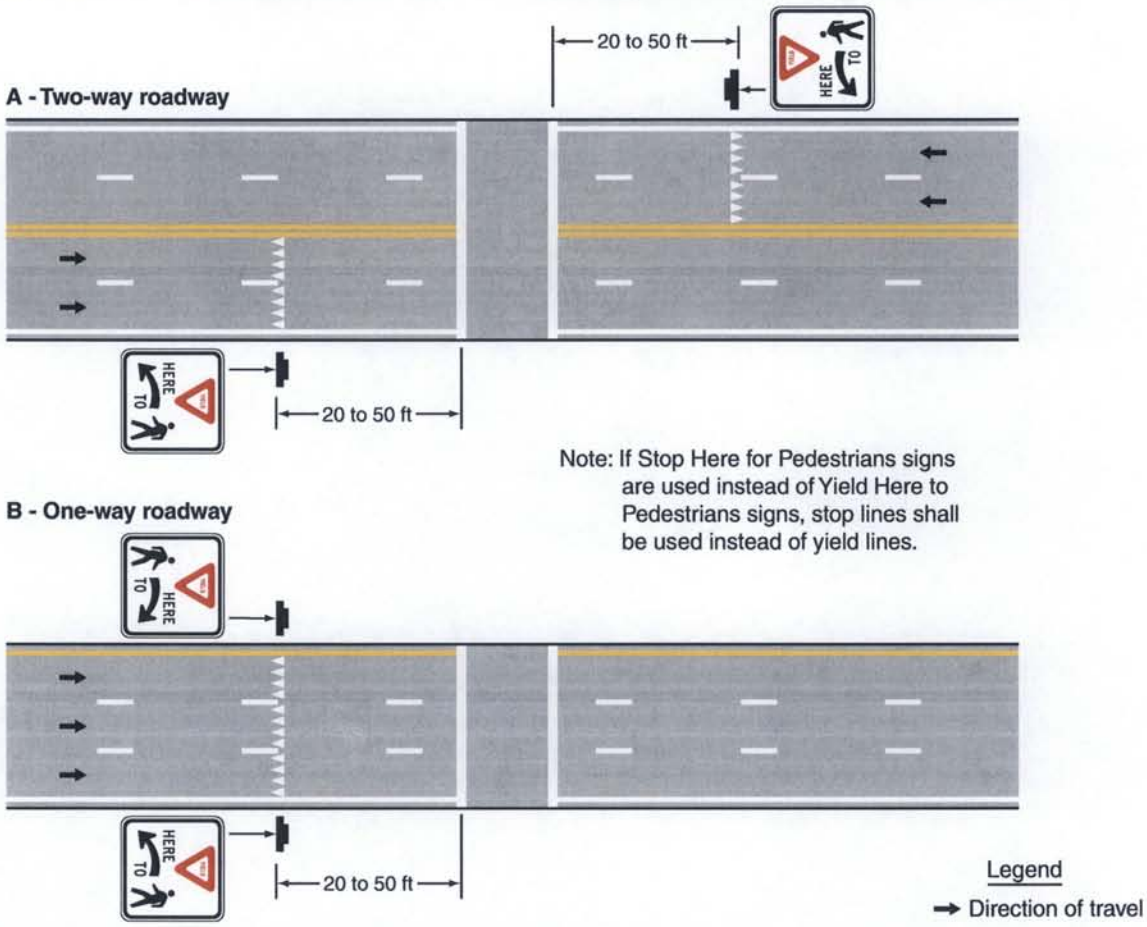
08 In-Street Pedestrian Crossing signs and Yield Here To (Stop Here For) Pedestrians signs may be used together at the same crosswalk.

Section 2B.12 <u>In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9, and R1-9a)</u>

Option:

01 The In-Street Pedestrian Crossing (R1-6 or R1-6a) sign (see Figure 2B-2) or the Overhead Pedestrian Crossing (R1-9 or R1-9a) sign (see Figure 2B-2) may be used to remind road users of laws regarding right-of-way at an unsignalized pedestrian crosswalk. The legend STATE LAW may be displayed at the top of the R1-6, R1-6a, R1-9, and R1-9a signs, if applicable. On the R1-6 and R1-6a signs, the legends STOP or YIELD may be used instead of the appropriate STOP sign or YIELD sign symbol.

Figure 3B-17. Examples of Yield Lines at Unsignalized Midblock Crosswalks



Section 3B.18 Crosswalk Markings

Support:

01 Crosswalk markings provide guidance for pedestrians who are crossing roadways by defining and delineating paths on approaches to and within signalized intersections, and on approaches to other intersections where traffic stops.

02 In conjunction with signs and other measures, crosswalk markings help to alert road users of a designated pedestrian crossing point across roadways at locations that are not controlled by traffic control signals or STOP or YIELD signs.

03 At non-intersection locations, crosswalk markings legally establish the crosswalk.

Standard:

04 **When crosswalk lines are used, they shall consist of solid white lines that mark the crosswalk. They shall not be less than 6 inches or greater than 24 inches in width.**

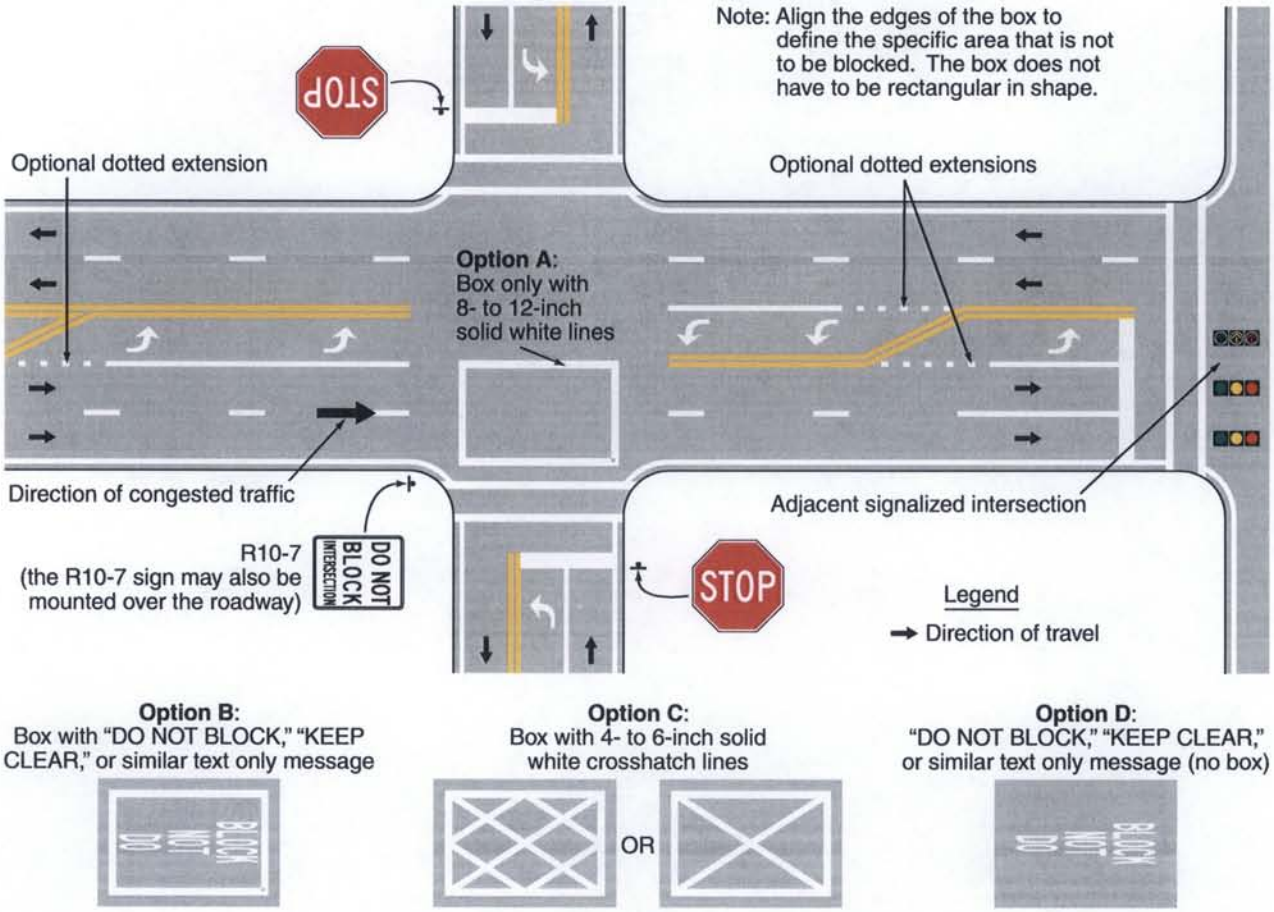
Guidance:

05 *If transverse lines are used to mark a crosswalk, the gap between the lines should not be less than 6 feet. If diagonal or longitudinal lines are used without transverse lines to mark a crosswalk, the crosswalk should be not less than 6 feet wide.*

06 *Crosswalk lines, if used on both sides of the crosswalk, should extend across the full width of pavement or to the edge of the intersecting crosswalk to discourage diagonal walking between crosswalks (see Figures 3B-17 and 3B-19).*

07 *At locations controlled by traffic control signals or on approaches controlled by STOP or YIELD signs, crosswalk lines should be installed where engineering judgment indicates they are needed to direct pedestrians to the proper crossing path(s).*

Figure 3B-18. Do Not Block Intersection Markings



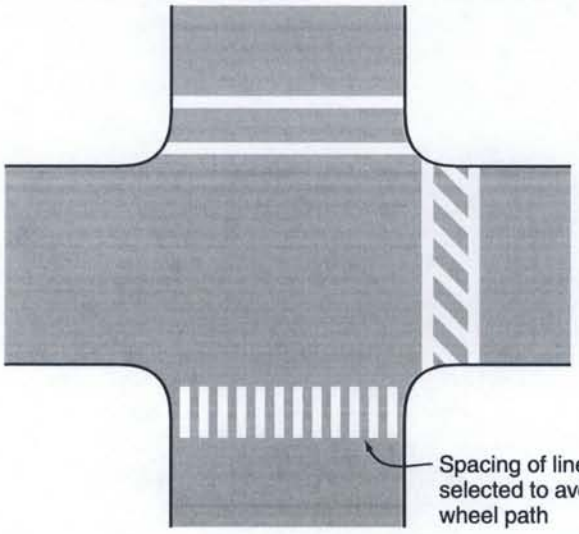
08 *Crosswalk lines should not be used indiscriminately. An engineering study should be performed before a marked crosswalk is installed at a location away from a traffic control signal or an approach controlled by a STOP or YIELD sign. The engineering study should consider the number of lanes, the presence of a median, the distance from adjacent signalized intersections, the pedestrian volumes and delays, the average daily traffic (ADT), the posted or statutory speed limit or 85th-percentile speed, the geometry of the location, the possible consolidation of multiple crossing points, the availability of street lighting, and other appropriate factors.*

09 *New marked crosswalks alone, without 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 not be installed across uncontrolled roadways where the speed limit exceeds 40 mph and either:*

A. 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 or greater; or

B. The roadway has four or more lanes of travel with a raised median or pedestrian refuge island and an ADT of 15,000 vehicles per day or greater.

Figure 3B-19. Examples of Crosswalk Markings



Support:

10 Chapter 4F contains information on Pedestrian Hybrid Beacons. Section 4L.03 contains information regarding Warning Beacons to provide active warning of a pedestrian's presence. Section 4N.02 contains information regarding In-Roadway Warning Lights at crosswalks. Chapter 7D contains information regarding school crossing supervision.

Guidance:

11 *Because non-intersection pedestrian crossings are generally unexpected by the road user, warning signs (see Section 2C.50) should be installed for all marked crosswalks at non-intersection locations and adequate visibility should be provided by parking prohibitions.*

Support:

12 Section 3B.16 contains information regarding placement of stop line markings near crosswalk markings.

Option:

13 For added visibility, the area of the crosswalk may be marked with white diagonal lines at a 45-degree angle to the line of the crosswalk or with white longitudinal lines parallel to traffic flow as shown in Figure 3B-19.

14 When diagonal or longitudinal lines are used to mark a crosswalk, the transverse crosswalk lines may be omitted. This type of marking may be used at locations where substantial numbers of pedestrians cross without any other traffic control device, at locations where physical conditions are such that added visibility of the crosswalk is desired, or at places where a pedestrian crosswalk might not be expected.

Guidance:

15 *If used, the diagonal or longitudinal lines should be 12 to 24 inches wide and separated by gaps of 12 to 60 inches. The design of the lines and gaps should avoid the wheel paths if possible, and the gap between the lines should not exceed 2.5 times the width of the diagonal or longitudinal lines.*

Option:

16 When an exclusive pedestrian phase that permits diagonal crossing of an intersection is provided at a traffic control signal, a marking as shown in Figure 3B-20 may be used for the crosswalk.

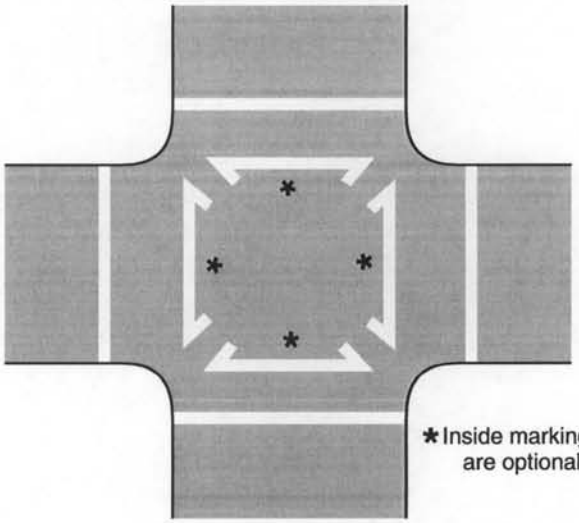
Guidance:

17 *Crosswalk markings should be located so that the curb ramps are within the extension of the crosswalk markings.*

Support:

18 Detectable warning surfaces mark boundaries between pedestrian and vehicular ways where there is no raised curb. Detectable warning surfaces are required by 49 CFR, Part 37 and by the Americans with Disabilities Act (ADA) where curb ramps are constructed at the junction of sidewalks and the roadway, for marked and unmarked crosswalks. Detectable warning surfaces contrast visually with adjacent walking surfaces, either light-on-dark, or dark-on-light. The "Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)" (see Section 1A.11) contains specifications for design and placement of detectable warning surfaces.

Figure 3B-20. Example of Crosswalk Markings for an Exclusive Pedestrian Phase that Permits Diagonal Crossing



Section 3B.19 Parking Space Markings

Support:

01 Marking of parking space boundaries encourages more orderly and efficient use of parking spaces where parking turnover is substantial. Parking space markings tend to prevent encroachment into fire hydrant zones, bus stops, loading zones, approaches to intersections, curb ramps, and clearance spaces for islands and other zones where parking is restricted. Examples of parking space markings are shown in Figure 3B-21.

Standard:

02 **Parking space markings shall be white.**

CHAPTER 7C. MARKINGS

Section 7C.01 Functions and Limitations

Support:

01 Markings have definite and important functions in a proper scheme of school area traffic control. In some cases, they are used to supplement the regulations or warnings provided by other devices, such as traffic signs or signals. In other instances, they are used alone and produce results that cannot be obtained by the use of any other device. In such cases they serve as an effective means of conveying certain regulations, guidance, and warnings that could not otherwise be made clearly understandable.

02 Pavement markings have some potential limitations. They might be obscured by snow, might not be clearly visible when wet, and might not be durable when subjected to heavy traffic. In spite of these potential limitations, they have the advantage, under favorable conditions, of conveying warnings or information to the road user without diverting attention from the road.

Section 7C.02 Crosswalk Markings

Guidance:

01 *Crosswalks should be marked at all intersections on established routes to a school where there is substantial conflict between motorists, bicyclists, and student movements; where students are encouraged to cross between intersections; where students would not otherwise recognize the proper place to cross; or where motorists or bicyclists might not expect students to cross (see Figure 7A-1).*

02 *Crosswalk lines should not be used indiscriminately. An engineering study considering the factors described in Section 3B.18 should be performed before a marked crosswalk is installed at a location away from a traffic control signal or an approach controlled by a STOP or YIELD sign.*

03 *Because non-intersection school crossings are generally unexpected by the road user, warning signs (see Sections 7B.11 and 7B.12) should be installed for all marked school crosswalks at non-intersection locations. Adequate visibility of students by approaching motorists and of approaching motorists by students should be provided by parking prohibitions or other appropriate measures.*

Support:

04 Section 3B.18 contains provisions regarding the placement and design of crosswalks, and Section 3B.16 contains provisions regarding the placement and design of the stop lines and yield lines that are associated with them. Provisions regarding the curb markings that can be used to establish parking regulations on the approaches to crosswalks are contained in Section 3B.23.

Section 7C.03 Pavement Word, Symbol, and Arrow Markings

Option:

01 If used, the SCHOOL word marking may extend to the width of two approach lanes (see Figure 7C-1).

Guidance:

02 *If the two-lane SCHOOL word marking is used, the letters should be 10 feet or more in height.*

Support:

03 Section 3B.20 contains provisions regarding other word, symbol, and arrow pavement markings that can be used to guide, warn, or regulate traffic.

Figure 7C-1. Two-Lane Pavement Marking of "SCHOOL"