City of
SACRAMENTO

2021

PEDESTRIAN CROSSING GUIDELINES

April 2021

DEFINING CROSSWALKS

The following California Vehicle Code (CVC) excerpts provide the legal definitions and right-of-way control for crosswalks:

CVC Section 275. Crosswalk is either:

(a) That portion of a roadway included within the prolongation or connection of the boundary lines of sidewalks at intersection where the intersecting roadways meet at approximately right angles, except the prolongation of such lines from an alley across a street.

(b) Any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface. Notwithstanding the foregoing provisions of this section, there shall not be a crosswalk where local authorities have placed signs indicating no crossing.

CVC Section 21950. Right-of-Way at Crosswalks:

(a) The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection, except as otherwise provided in this chapter.

(b) This section does not relieve a pedestrian from the duty of using due care for his or her safety. No pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle that is so close as to constitute an immediate hazard. No pedestrian may unnecessarily stop or delay traffic while in a marked or unmarked crosswalk.

(c) The driver of a vehicle approaching a pedestrian within any marked or unmarked crosswalk shall exercise all due care and shall reduce the speed of the vehicle or take any other action relating to the operation of the vehicle as necessary to safeguard the safety of the pedestrian.

(d) Subdivision (b) does not relieve a driver of a vehicle from the duty of exercising due care for the safety of any pedestrian within any marked crosswalk or within any unmarked crosswalk at an intersection.

City of SACRAMENTO

KITTELSON & ASSOCIATES

2510 J Street, Suite 200

Sacramento, CA 95816

916.822.5351

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ABBREVIATIONS AND ACRONYMS

ADA	Americans with Disabilities Act
ADT	Average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
APS	Accessible pedestrian signal
CA MUTCD	(Caltrans) California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CPUC	California Public Utilities Commission
CTCDC	California Traffic Control Devices Committee
CVC	California Vehicle Code
DPM	(City of Sacramento) Design and Procedures Manual
FHWA	Federal Highway Administration
HDM	(Caltrans) Highway Design Manual
IA	Interim Approval
IRWLs	In-Roadway Warning Lights
ITE	Institute of Transportation Engineers
LED	Light emitting diode
mph or mi/h	Miles per hour
MUTCD	Manual on Uniform Traffic Control Devices
NACTO	National Association of City Transportation Officials
NCHRP	National Cooperative Highway Research Program
PHB	Pedestrian Hybrid Beacon
RRFB	Rectangular Rapid Flashing Beacon
TCRP	Transit Cooperative Research Program
TRB	Transportation Research Board
VPH or vph	Vehicles per hour

EXECUTIVE SUMMARY

Purpose

The City of Sacramento 2021 Pedestrian Crossing Guidelines (Guidelines) provide guidance for the design and installation of marked crosswalks within the City of Sacramento. These guidelines document the preferred practice for the design and installation of marked crosswalks in Sacramento, subject to engineering judgement on a site-by-site basis. This document integrates available research related to pedestrian crossing facilities and recommended treatments with emphasis on designing streets that support a safe and walkable urban environment.

These guidelines are not meant to be rigid standards, rather, they provide additional guidance subject to engineering judgement on a case-by-case basis. The guidance seeks to maintain a reasonable balance between prescriptive requirements and flexibility based on engineering judgement, engineering study, and other necessary and useful considerations.

Candidate Marked Crosswalk Locations

The Guidelines provide suggested practices for evaluating candidate Marked Crosswalk Locations at uncontrolled crossing locations (i.e., at intersections and midblock locations that are not controlled by a traffic signal, stop, or yield sign). These locations may be identified as candidate locations either by City staff or as a request from the public. The guidance provides the following stepwise process (**Section 2.2**):

Step 1: Initial Location Screening

Uncontrolled marked crosswalks are ultimately appropriate at locations that meet the following conditions:

DEMAND:

Is there sufficient observed or latent demand?

DISTANCE TO NEAREST CROSSING:

Is the nearest marked crossing at least 300 feet away?

VISIBILITY:

Are the roadway and traffic conditions appropriate for providing a marked crossing?

CROSSING SPACING:

Will the marked crossing fill a gap in marked crosswalk spacing?

Exceptions to these conditions on a case-by-case basis. Refer to **Section 2.2** on page 3 and the **Crossing Location Evaluation Overview Flowchart** on page 8 for more information.

Step 2: Data Collection

If a location is appropriate for a marked crosswalk, the Guidelines recommend collecting the following data to inform treatment selection:

ROADWAY CHARACTERISTICS

BEHAVIORAL CHARACTERISTICS

LOCATION CHARACTERISTICS

Refer to pages 10-12 for a complete list of data to collect and collection worksheets.

Step 3: Treatment Selection

Step 3 provides guidance for selecting the following crossing enhancements (refer to **TABLE 2** on Page 14 and to the *Treatment Applications Guide*) based on the data collected in Step 2:

- High-visibility crosswalk markings (with parking restrictions, adequate nighttime lighting levels, and crossing warning signs)
- Raised crosswalk
- Advance yield sign and markings
- In-street pedestrian crossing sign
- Curb extension
- Pedestrian refuge island
- Rectangular Rapid Flashing Beacon (RRFB)
- Road diet
- Pedestrian hybrid beacon (PHB)

Evaluating Existing Uncontrolled Marked Crosswalks

The Guidelines provide suggested practices for evaluating existing uncontrolled marked crosswalks, with the following considerations:

WHEN TO EVALUATE (SECTION 3.1)

Evaluate as…

- Part of a land use project
- Part of a roadway project
- Part of a resurfacing project
- Outcome of traffic investigation[1]

HOW TO EVALUATE, ENHANCE, OR UPGRADE (SECTION 3.2)

- Add location to citywide inventory
- Consult context classification guidance in Section 2 and treatment guidance in Section 4

HOW TO CONSIDER FEASIBILITY (SECTION 3.3)

- Evaluate based on location Type guidance
- Document determination

WHEN TO REMOVE MARKED CROSSWALKS (SECTION 3.4)

Remove as an exceptional case subject to:

- Engineering evaluation
- Overriding safety considerations
- Improvements determined to be infeasible[2]
- Appropriate outreach conducted

Prioritizing Enhancement Locations

The Guidelines provide the criteria and process for prioritizing locations for crosswalk enhancement (**Section 3.5**). The criteria include:

- Crash history
- Demand
- Transit stop presence
- Vision Zero High Injury Network
- School Zone
- Social Equity (location is within a disadvantaged community)

Defining Crosswalk Marking Treatments

Section 4 of the guidance establishes basic signing and markings associated with different crosswalk types. The guidance uses the 2018 FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* as the basis for location types where enhancements may be necessary or desirable (see **TABLE 3** on page 28).

[1] A traffic investigation is a review of a specific location by City staff due to a traffic safety concern based on a public or internal request, including crosswalk reviews.

[2] Improvements may be determined to be infeasible due to a variety of factors including cost, right of way constraints, or a lack of infrastructure, among others.

1.0 INTRODUCTION

1.1 Purpose and Scope

The City of Sacramento 2021 Pedestrian Crossing Guidelines provide guidance for the design and installation of marked crosswalks within the City of Sacramento. These guidelines document the preferred practice for the design and installation of marked crosswalks in Sacramento, subject to engineering judgement on a site-by-site basis. This document was adopted by City Council on April 20, 2021 (Resolution No. 2021-0093) and, as such, supersedes the 2014 Pedestrian Crossing Guidelines.

This document integrates available research related to pedestrian crossing facilities and recommended treatments with emphasis on designing streets that support a safe and walkable urban environment. Where applicable, the guidelines reflect pertinent current standards or regulations at the time of preparation of these guidelines (2021).

The City regularly receives requests to install marked crosswalks from various customers including residents, businesses, and institutions. This document provides guidance on the fundamental aspects of pedestrian crossings. The guidance can be used to determine if a marked crosswalk would be appropriate at a requested location and identifies a range of pedestrian crossing enhancement treatments that can be used to help accomplish the goal of getting pedestrians safely across the roadway. Accordingly, the guidelines and other provisions set forth in this document are based on the current versions of pertinent codes and treatises such as the California Vehicle Code (CVC), Caltrans' Manual on Uniform Traffic Control Devices (CA MUTCD), and the Highway Design Manual (HDM), among other standards or regulations. **Appendix A** provides details on the legal definition of a crosswalk, the relationship between crosswalks and associated standards and regulations, as well as key definitions.

These guidelines integrate these referenced resources and 2021 best practices to provide guidance on concepts and treatments related to pedestrian crossings in the City of Sacramento with a focus on uncontrolled pedestrian crossings. For pedestrian crossing treatments or enhancements, please note the following:

- the City of Sacramento's practice is to use traffic control devices that are approved for use in California.
- with advancement in engineering practice and technology, new treatments and devices may become available in the future. The City Traffic Engineer may approve the use of such treatments and devices, as determined appropriate. The City Traffic Engineer's powers and duties are defined in Section 10.08.040 of the Sacramento City Code as:

The city traffic engineer shall: determine the installation and proper timing and maintenance of traffic-control devices and signals; conduct engineering analyses of traffic accidents and devise remedial measures; conduct engineering investigation of traffic conditions and co-operate with other city officials in the development of ways and means to improve traffic conditions; and carry out the additional powers and duties imposed by this title and other ordinances of the city.

- treatments recommended in these guidelines reflect common treatments currently in use and may not include every treatment available.
- multiple treatment options are provided, where feasible, to provide flexibility in selection of appropriate treatments depending on the context and site-specific conditions of the crossing locations.

This is a technical document to guide the decision-making for marking crosswalks and the determination of appropriate crossing enhancement treatments. It is not aimed at addressing planning or policy-related aspects of walking as a mode of transportation. Those aspects are addressed in the City's *Pedestrian Master Plan*. The companion document City of Sacramento *Pedestrian Crossing Guidelines Treatment Applications Guide* contains more information and guidance for crossing treatments.

1.2 Flexibility and the Role of Engineering Judgement

These guidelines are not meant to be rigid standards, rather, they provide additional guidance subject to engineering judgement on a case-by-case basis. The guidance seeks to maintain a reasonable balance between prescriptive requirements and flexibility based on engineering judgement, engineering study, and other necessary and useful considerations. Accordingly, the guidelines incorporate provisions pursuant to which the City Traffic Engineer may consider variations and exceptions in certain circumstances.

In some instances, this document may not provide a definitive solution absent the exercise of engineering judgement or engineering study by the City Traffic Engineer. In all situations, the exercise of engineering judgement and/or engineering study are emphasized as integral components of the decision-making process.

1.3 Crosswalk Overview

Legal pedestrian crossings exist at all non-alley intersections that meet at approximately right angles, whether marked crosswalks are present or not, except where a pedestrian crossing is specifically prohibited. Marked crosswalks serve to alert road users to expect crossing pedestrians and to direct pedestrians to desirable crossing locations. At mid-block locations, crosswalks only exist where marked. At these non-intersection locations, it is the crosswalk markings that legally establish a crosswalk.

These guidelines are consistent with the CA MUTCD which at the time of publication provides uniform standards and specifications for crosswalk markings and all other official traffic control devices in California.

1.4 Updating the Guidance

These guidelines should be updated to reflect advancements in the engineering practice and changes in best practices for pedestrian crossings, as needed. The City Traffic Engineer shall determine when and the extent to which any update to the Pedestrian Crossing Guidelines is necessary to maintain consistency with best practices and engineering guidance.

2.0 EVALUATING CANDIDATE MARKED CROSSWALK LOCATIONS

2.1 Overview

This chapter describes suggested practices for evaluating candidate marked crosswalk locations. Candidate marked crosswalk location are sites identified by City staff or requested by members of the public. Crosswalk marking practices at signalized and stop- or yield- controlled locations differ from uncontrolled crossings. The identification of candidate marked crosswalk locations is a two-stage process:

Locate pedestrian desire lines. Pedestrian desire lines for crossings are the places where people would like to cross the street. These locations are influenced by elements of the roadway network, such as transit stops, and nearby land uses (homes, schools, parks, trails, commercial centers, etc.).

Identify where people can cross safely. Of all road users, pedestrians have the highest risk of injury in a collision because they are the least protected. Choosing the location for a marked crosswalk must consider the site context to determine the most appropriate crossing location to improve walking accessibility and safety.

2.2 Crosswalks at Uncontrolled Crossing Locations

Uncontrolled crossings are:

- At intersections and midblock locations that are not controlled by a traffic signal, stop, or yield sign; and,
- may have marked crosswalks or unmarked crosswalks (as defined in CVC Section 275).

Notwithstanding the provisions of the CVC, there shall not be a crosswalk where local authorities have placed signs indicating no crossing.

The guidance below is provided to assist in the interpretation of the CVC for City of Sacramento staff and public users when determining the presence of an unmarked crosswalk:

- An unmarked crosswalk must be at an intersection.
- There cannot be an unmarked mid-block crosswalk.
- There cannot be an unmarked crosswalk at an intersection without sidewalks on at least one side.
- Intersecting roadways must meet at approximately right angles and cannot include an alley.

The CA MUTCD Section 3B.18 provides standards, guidance, and supporting information for crosswalk markings.

For uncontrolled crossing locations, the CA MUTCD recommends 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. This engineering study should consider:

- number of lanes;
- median presence;
- distance from adjacent signalized intersections;
- pedestrian volumes and delays;
- average daily traffic;
- posted and 85th percentile speed (when available);
- roadway or intersection geometry;
- pedestrian desire lines;
- crossing point consolidation;
- lighting presence; and,
- other appropriate factors, as needed.

A three-step process has been developed and refined by the City of Sacramento to help determine if an uncontrolled location is a potential candidate for a marked crosswalk. The steps provide guidance on the appropriateness of various additional crossing treatments for consideration if marking the crosswalk based on speed, average daily traffic, and roadway geometry.

Step 1:

Initial Location Screening provides a flow chart to assist City staff in evaluating the appropriateness of an uncontrolled crossing location for a marked crosswalk.

Step 2:

Data Collection provides data collection forms to assist City staff in gathering appropriate data to determine a recommended marked crosswalk location and associated treatments.

Step 3:

Treatment Selection provides guidance on selecting between additional treatments appropriate at the uncontrolled crossing site if it is recommended for crosswalk marking.

Step 1: Initial Location Screening

The first step of the uncontrolled crossing location evaluation is an initial screening process to objectively evaluate the general appropriateness of an uncontrolled marked crosswalk at a specific location; this is undertaken in coordination with engineering judgement. This evaluation of the proposed pedestrian crossing site conditions addresses the following fundamental questions:

- Is there sufficient observed or latent demand?
- Is there another appropriate crossing location nearby?
- Are the roadway and traffic conditions appropriate for providing a marked crossing?
- Will the marked crossing fill a gap in marked crosswalk spacing?

These questions form the basis for determining whether to mark a crosswalk at a location. **FIGURE 1** (page 8) illustrates the flow of the decision-making process for evaluating a crossing location for a potential marked crosswalk. Each factor for the decision-making process is discussed in the subsections that follow.

DEMAND

GUIDANCE:
Uncontrolled locations should be considered for marking if there is sufficient pedestrian crossing demand (either measured through actual counts or latent demand) at the study location according to the following criteria:

- Pedestrian volumes of 20 or more are expected during the peak hour of pedestrian demand; or,
- Elderly, children, disabled, and/or sight-impaired pedestrian volumes of 15 or more are expected during the peak hour of pedestrian demand; or,
- Pedestrians volumes of 15 or more are expected during any two or more hours throughout the day.
- **Demand Exceptions:** If the proposed marked crosswalk location provides access to a trail/shared-use path, is on the Vision Zero Action Plan High-Injury Network, or is on a direct pedestrian route to certain destinations like a school, park, senior center, community center, hospital, transit stop, the City Traffic Engineer may consider an exception to the minimum demand requirements on a case-by-case basis.

In evaluating demand for new crossings, the minimum thresholds should consider both existing and estimated future demand at the site. Estimated future demand should be determined using engineering judgement based on anticipated impending land use or other contextual changes to the area near the study location that could increase pedestrian activity and crossing demand at the study location. When considering estimated future demand City staff should also consider whether pedestrian crossings are currently reduced due to the lack of a marked crosswalk or, when appropriate, enhanced crosswalk at the study location.

If the study location does not meet the pedestrian demand guidance the location may still be evaluated through the remaining steps of the evaluation process to consider its overall context within the transportation network, using engineering judgement. If the result of such an evaluation suggests that the location is appropriate for marking the crosswalk considering the overall context, the City Traffic Engineer may make a determination (on a case–by–case basis) as to whether or not to mark the crossing at the study location, even if the pedestrian demand requirements are not satisfied.

DISTANCE TO THE NEAREST CROSSWALK

GUIDANCE:
At an uncontrolled crossing location, crosswalks should be considered for marking if the nearest marked or controlled pedestrian crossing distance is greater than or equal to 300 feet from the study location.

The nearest crosswalk may be controlled or an appropriately treated marked uncontrolled crossing. An appropriately treated uncontrolled crossing is considered as one having the signage, pavement markings, and the pedestrian crossing treatments that are consistent with the applicable guidelines in this document.

Staff should evaluate and confirm that the proposed marked crosswalk at the location under consideration is appropriate based on the site conditions, the ability to consolidate multiple crossing locations, and to effectively channelize pedestrians.

The 300-foot distance is general guidance, rather than an absolute minimum requirement or a controlling design criterion. The City Traffic Engineer may consider an exception in this regard on a case-by-case basis based on engineering judgement, and other considerations such as:

- pedestrian crossing demand;
- unique conditions pertaining to the proposed crossing site;
- the need to consolidate multiple crossing points or to channel pedestrians to preferred crossing locations, such as controlled approaches, and/or appropriately treated uncontrolled crosswalks; or,
- overall context pertaining to the crossing site (e.g., land uses or roadway and traffic conditions such as number of lanes, traffic volume, and speed), that may justify marking the pedestrian crossing at the desired location.

VISIBILITY

GUIDANCE:

Sight distance should be measured in the field to determine adequacy for approaching motorists to see and stop for a pedestrian starting to cross the street at the crosswalk. Stopping sight distance should be measured based on a pedestrian having stepped with one foot in the bike lane or roadway at the crossing, showing the intent to cross. If minimum stopping sight distance is not met, consideration should be given to removing the obstruction(s) or implementing treatments to slow vehicle speeds on the approach to the crossing to reduce the required stopping sight distance. Vehicle stopping sight distance should be measured in accordance with the Caltrans HDM as shown in **TABLE 1**. If stopping sight distance cannot be adequately provided, the location is not appropriate for an uncontrolled marked crosswalk.

The availability of lighting to illuminate the proposed crosswalk should be evaluated to determine nighttime visibility as per the CA MUTCD. If there are special circumstances that necessitate nighttime illumination and illumination is not present, the location may not be appropriate for an uncontrolled marked crosswalk. Special circumstances may include high levels of nighttime pedestrian activity due to adjacent land uses such as a theater or anticipated frequent vehicle-pedestrian conflicts under nighttime conditions.

Sight distance is the length of the roadway ahead that is visible to the driver or pedestrian. The available stopping sight distance on a roadway should be sufficient to enable a vehicle traveling at or near the design speed to stop before reaching a pedestrian in the crosswalk. This assessment should be based on the posted speed limit or 85th percentile speed, when available. For locations with separated bike lanes (Class IV bikeways) with painted or raised islands separating the bike lane from vehicle traffic, stopping sight distance should be measured from the crossing point from the location furthest into the roadway cross-section that provides a detectable warning surface to assist and warn pedestrians who are blind or visually-impaired.

Overhead lighting at a crossing provides increased visibility of pedestrians and the crossing by increasing the luminance contrast at the location. Luminance contrast is based on the difference in the measured brightness of the object of interest and its background. The presence of lighting should be determined when evaluating a crossing location. Where lighting is not present, the City Traffic Engineer may consider an exception on a case-by-case basis based on engineering judgement.

STOPPING SIGHT DISTANCE VALUES

The stopping sight distances for various speeds on level roadways are shown in the following table. The posted speed or 85th percentile speed, when available, should be used as the design speed for evaluating stopping sight distance for this guidance. When both the posted speed and 85th percentile speed are available, the higher of the two values should be used to determine the appropriate stopping sight distance.

TABLE 1 Stopping Sight Distance on Level Roadways

DESIGN SPEED (MPH)	STOPPING SIGHT DISTANCE (FT)
10	50
15	100
20	125
25	150
30	200
35	250
40	300
45	360
50	430
55	500
60	580
65	660

Source: Adapted from the Caltrans Highway Design Manual, 2018.

CROSSWALK SPACING

GUIDANCE:

The distance between existing marked crosswalks should be measured from the evaluation site. The desired spacing frequency for marked crossings in the City of Sacramento is context-based, such that certain areas of the City have a higher crossing frequency standard than others based on the expected pedestrian demand and land use. The City's crosswalk spacing standards are detailed below and based on a typical 400-foot block in Downtown Sacramento. Block lengths were measured from the center of adjacent intersections. Using this typical block as a reference for crossing frequencies, minimum desired crossing frequencies were established.

THE GRID:

- This context zone is made up of the area bounded by the American River, Interstate 5, Broadway, and the Capital City Freeway.
- Desired marked crossing frequency: 800 feet (every other block)

VISION ZERO HIGH INJURY NETWORK:

- This context zone is made up of the High Injury Network as designated in the Vision Zero Action Plan.
- Desired marked crossing frequency: 1,200 feet (every third block)

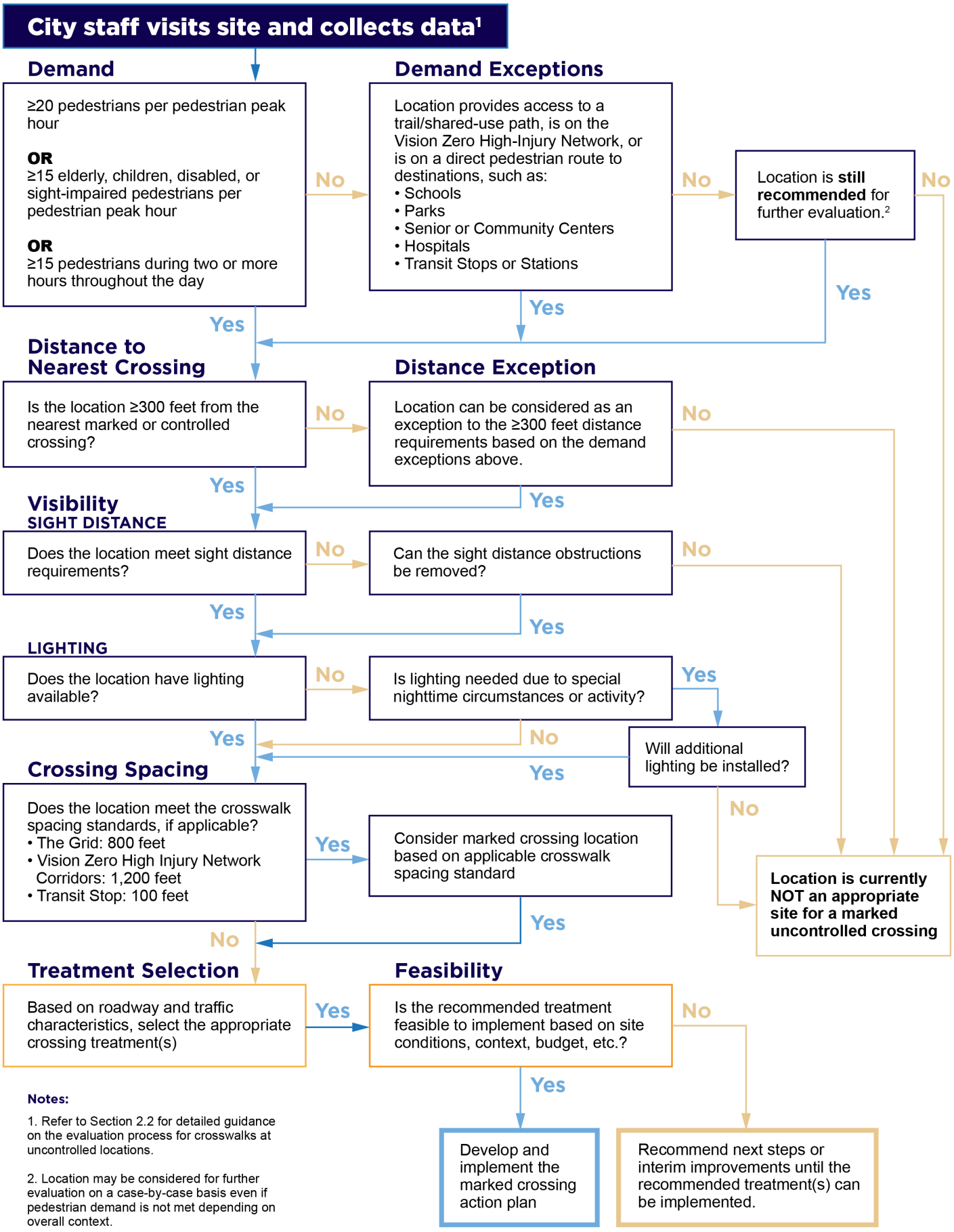
TRANSIT STOPS:

- Marked or enhanced crossings should be provided within 100 feet of all new transit stops if pedestrians can reasonably be expected to desire crossing the street at the transit stop.
- If a marked crossing cannot be installed within 100 feet of a new transit stop, the City should coordinate with the transit provider to identify an alternative crossing location to serve the transit stop, or coordinate to relocate the transit stop to a location where a marked or enhanced crossing can be provided.

ADDITIONAL GUIDANCE:

- For all other locations, no marked crosswalk spacing standard has been established.
- The City Traffic Engineer may consider an exception to the spacing guidance on a case-by-case basis based on engineering judgement, and other considerations at the potential crossing location.

FIGURE I Crossing Location Evaluation Overview Flowchart



Notes:

1. Refer to Section 2.2 for detailed guidance on the evaluation process for crosswalks at uncontrolled locations.

2. Location may be considered for further evaluation on a case-by-case basis even if pedestrian demand is not met depending on overall context.

Step 2: Data Collection

Once a location is determined to be appropriate for marking a crosswalk in Step 1, additional data should be obtained for roadway and traffic characteristics at the candidate location. In addition to collecting the data to determine the appropriateness of marking the crosswalk in Step 1, the following roadway characteristics should be documented for the candidate location:

ROADWAY CHARACTERISTICS

- existing pedestrian-related signs, markings, or other treatments/devices;
- posted speed or 85th percentile speed (when available);
- number of travel lanes for each approach;
- turn lane presence and type;
- medians or refuge islands;
- roadway width (curb to curb);
- sidewalk, bike lane, and/or trail presence;
- curb ramps and driveways;
- street lighting presence at the crossing location;
- drain inlets;
- on-street parking, alignment, and marked or signed restrictions; and,
- any other pertinent details

In addition to the roadway characteristics, pedestrian crossing and vehicle traffic behaviors should be observed and documented during the data collection. Behavioral observations should be recorded where pedestrian or vehicle activity is determined based on engineering judgement to have the potential to influence how pedestrians and vehicles may interact at the crossing locations. Potential behavioral characteristics that may be observed and recorded are summarized below.

BEHAVIORAL CHARACTERISTICS

- pedestrian crossing patterns near activity centers and pedestrian generators such as transit stops, schools, commercial districts, senior facilities, etc.;
- driver compliance at crosswalks and intersections; and,
- other pertinent pedestrian or driver actions based on observation.

Plans and historical data should also be reviewed to identify additional characteristics that may influence the decision to mark a crosswalk or include additional treatments. Additional data to consider include:

ADDITIONAL LOCATION CHARACTERISTICS:

- average daily traffic (ADT);
- transit boarding volumes from nearby stops;
- the most recent five years of available pedestrian-involved crash data within 250 feet of the location under evaluation;
- relevant traffic investigation history for the prior five years;
- surrounding existing and future land use;
- known programmed or planned improvements at the location; and
- other pertinent information, as available.

The recommended data collection form is provided in **FIGURE 2**.

FIGURE 2 Uncontrolled Crosswalk Data Collection Form

Uncontrolled Crosswalk Data Collection Form

Location: _____

Prepared By: _____

Date Review Initiated: _____

Data Collection Type:

☐ Request to mark new crosswalk

☐ Existing marked crosswalk

ROADWAY CONDITIONS INVENTORY

Posted or 85th Percentile Speed

☐ ≤ 30 mph ☐ 35 mph ☐ ≥ 40 mph

Total Vehicles per Day

Average Daily Traffic (ADT): _____

Approximate Vehicles per Hour (VPH)*: _____

☐ ADT < 9,000

☐ ADT 9,000–15,000

☐ ADT > 15,000

Travel Lane Configuration

☐ 2 lanes

☐ 2 lanes one-way

☐ 3 lanes without raised median

☐ 3 lanes with raised median

☐ 3 lanes one-way

☐ 4+ lanes without raised median

☐ 4+ lanes with raised median

Crossing Length (feet):) _____

Raised median width (if present): _____

Refuge island present: ☐ Yes ☐ No

If yes, width of refuge island: _____

**VPH should be estimated if a PHB may be considered at the site. VPH is used to determine consistency with the PHB guidance in CA MUTCD Section 4F.1. VPH may be estimated by dividing the ADT by 24.*

INITIAL LOCATION SCREENING

Demand

☐ Location provides access to a trail, is on the Vision Zero High Injury Network, or is on a direct pedestrian route to destinations like a school, park, senior center, hospital, or transit stop.

☐ Location is recommended for further evaluation, even though it does not meet demand requirements

Notes and/or Justification:

_____

_____

_____

Distance to Nearest Crossing

Name of nearest pedestrian crossing location on an approach controlled by a traffic signal, stop, or yield:

_____

Distance to crossing above: _____

☐ Location is recommended for further evaluation, even though it does not meet crossing distance requirements

Name of nearest location with appropriately treated uncontrolled marked crosswalk:

_____

Distance to marked crosswalk above:

_____

Notes and/or justification:

_____

_____

FIGURE 2 Uncontrolled Crosswalk Data Collection Form (Continued)

Visibility

SIGHT DISTANCE

Required stopping sight distance: _____

Stopping sight distance met (both approaches):

☐ Yes ☐ No

Location has adequate sight distance:

☐ Yes ☐ No

If no, can obstructions be removed:

☐ Yes ☐ No

If yes, note recommended measures:

_____

LIGHTING

Lighting is present at the crossing location:

☐ Yes ☐ No

If no, note recommended measures:

_____

_____

_____

Crosswalk Spacing

Location is subject to crosswalk spacing standards:

☐ Yes, Grid

☐ Yes, Vision Zero High Injury Network

☐ No

If yes, existing marked crossings locations:

_____

_____

Distance between marked crossing locations:

_____

PEDESTRIAN SAFETY ISSUES INVENTORY

Noted conflicts at crossing locations ☐ Yes ☐ No

☐ History of turning movement crashes

☐ Observed conflicts at permitted crossing

Vehicle speed ☐ Yes ☐ No

☐ History of speed-related crashes

Drivers not yielding to pedestrians in crosswalks ☐ Yes ☐ No

☐ Crash history in marked crosswalks

Separation between pedestrians and traffic: ☐ Yes ☐ No

☐ No buffer (e.g., landscape buffer, on-street parking, bike lanes)

Notes:

_____

FIGURE 2 Uncontrolled Crosswalk Data Collection Form (Continued)

Would a marked crosswalk be appropriate based on site conditions, the ability to channelize pedestrians, and the consolidation of multiple crossings?

☐ Yes ☐ No

If no, state reasons or contributing factors:

_____

_____

Recommend measures (if any) to make the location appropriate for marking the crosswalk:

_____

_____

Describe any known improvements programmed or planned at the location:

_____

_____

_____

Five-year crash history (attach crash diagram or incident summary):

☐ Pedestrian-related crashes: _____

☐ Total crashes: _____

Crash history notes:

_____

_____

Five-year relevant traffic investigation history notes:

_____

_____

ADDITIONAL DATA COLLECTION

Attach aerial(s) or sketches showing the following, as applicable:

☐ Study location

☐ Number of travel lanes/direction

☐ Median/pedestrian refuge island

☐ Pedestrian-related improvements

☐ Sidewalks + Bike Lanes

☐ Trail

☐ Parking

☐ Curb ramps/driveways

☐ Street lights

☐ Drain inlets

☐ Other pertinent details

Step 3: Treatment Selection

Step 3 focuses on determining whether a marked crosswalk alone is sufficient and, if not, what treatments are most appropriate. This determination is based on the candidate location's characteristics collected as part of Step 2, the recommended treatments by location type in **TABLE 2**, and engineering judgement.

TABLE 2 is adapted from the 2018 FHWA *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* which synthesizes the latest research and best practices for safety at uncontrolled pedestrian crossings. The table provides recommended treatments in a matrix by roadway configuration, posted speed, and traffic volumes. Given the conditions of each cell of the matrix, the treatments identified in the cell are classified into three levels of guidance:

- treatments that are candidates for the location type;
- treatments that should always be considered, but are not mandated or required (shown as a bolded number in a darkened box); and,
- crosswalk visibility enhancements that should always occur in conjunction with other identified treatments (shown as a bolded number in a darkened box with a black outline).

Once the candidate location context type and associated recommended treatments are identified, the selection of a treatment or package of treatments can proceed based on the specific site context and engineering judgement. Section 4 provides detailed guidance on appropriate treatments or enhancements based on the location type. The companion document City of Sacramento *Pedestrian Crossing Treatment Applications Guide* contains more detailed background information and guidance for crossing treatments.

TABLE 2 Application of Pedestrian Crossing Treatments by Location Type

Roadway Configuration	Posted Speed Limit and ADT																								
	Vehicle ADT <9,000									Vehicle ADT 9,000-15,000									Vehicle ADT >15,000						
	≤30 mph			35 mph			≥40mph			≤30 mph			35 mph			≥40mph			≤30 mph			35 mph			≥40mph		
2 lanes	**1**	2		**1**		3	**1**		3	**1**			1		3	**1**		3	**1**			**1**		3	**1**		3
	4	5	6		5	6		5	6	4	5	6		5	6		5	6	4	5	6		5	6		5	6
				7		9	**7**		**9**				7		9	**7**		**9**	7		9	7		9			**9**
2 lanes one-way	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5			**5**			**5**			**5**			**5**			**5**			**5**			**5**			**5**	
	7		9	7		9	7		**9**	7		9	**7**		**9**	**7**		**9**	**7**		9	7		**9**			**9**
3 lanes with raised median	**1**	2	3	**1**		**3**	**1**		**3**	**1**		3	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
	4	5			5			5		4	5			5			5		4	5			5			5	
				7		9	**7**		**9**	7		9	**7**		**9**	**7**		**9**	7		9	**7**		**9**			**9**
3 lanes without raised median	**1**	2	3	**1**		**3**	**1**		**3**	**1**		3	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
	4	5	6		5	6		5	6	4	**5**	6		5	6		5	6	4	5	6		5	6		5	6
	7		9	7		9	7		**9**	7		9	**7**		**9**	7		**9**	7		9			**9**			**9**
3 lanes one-way	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5			**5**			**5**			**5**			**5**			**5**			5			**5**			**5**	
	7	8	9	7	8	9	7	8	**9**	7	8	9	**7**	8	**9**	7	8	**9**	**7**	8	**9**		8	**9**		8	**9**
4+ lanes with raised median	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5			**5**			**5**			**5**			**5**			**5**			**5**			**5**			**5**	
	7	8	9	7	8	**9**	7	8	**9**		8	9	**7**	8	**9**		8	**9**	**7**	8	**9**		8	**9**		8	**9**
4+ lanes without raised median	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5	6		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**
	7	8	9	7	8	9		8	**9**		8	9	**7**	8	**9**		8	**9**	**7**	8	**9**		8	**9**		8	**9**

Treatments:

1. High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs.

2. Raised crosswalk

3. Advance Yield Here to (Stop Here For) Pedestrians sign and yield (stop line)

4. In-Street Pedestrian Crossing sign

5. Curb extension

6. Pedestrian refuge island

7. Rectangular Rapid-Flashing Beacon (RRFB)**

8. Road Diet

9. Pedestrian Hybrid Beacon (PHB)**

Selection Guidance:

#: treatments that are candidates for the location type

#: treatments shown as a bold number within a darkened box should always be considered, but are not mandated or required.

: treatments shown as a bolded number in a darkened box with a black outline are crosswalk visibility enhancements that should always occur in conjunction with other identified treatments.

** Note: The PHB and RRFB are not installed at the same crossing location

Source: Adapted from FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (July 2018)

2.3 Crosswalks at Controlled Crossing Locations

Controlled pedestrian crossing locations are intersection approaches as well as midblock crossing sites that are controlled by a traffic signal, stop, or yield control.

GUIDANCE:

- At locations controlled by traffic control signals or on approaches controlled by STOP or YIELD signs, crosswalk lines should be installed where engineering judgement indicates they are needed to direct pedestrians to the proper crossing path(s).
- At controlled approaches, limit lines (stop lines) help to define pedestrian paths and are therefore a factor the engineer may consider in deciding whether or not to mark the crosswalk.
- See CA MUTCD Section 3B.18 for more information.
- High-visibility crosswalk markings may be considered at controlled crossing locations on the Vision Zero High-Injury Network. Additional locations may be considered on a case-by-case basis by the City Traffic Engineer based on engineering judgement.

Section 4.4 of this document provides treatment guidance on crosswalks at signalized, stop, and/or yield controlled approaches.

2.4 Crossings at Mid-Block Locations

As defined above and because excluded from the definition of "crosswalk" in Section 275 of the CVC mid-block locations cannot have an unmarked crosswalk. In order to establish a crosswalk at a mid-block location, it must be marked.

GUIDANCE:

Mid-block crosswalks may not be expected by motorists. As a result, additional measures such as signage, curb extensions, and parking restrictions are recommended to improve visibility for both pedestrians and motorists. Particular attention should be given to roadways with two or more traffic lanes in one direction as a pedestrian may be hidden from view by a vehicle yielding the right-of-way to a pedestrian.

Mid-block crosswalks should only be considered if the following conditions apply:

- There is a demonstrated need for marking the mid-block crossing based on demand and/or the need for channelizing crossing pedestrians.
- The location is serving a trail or pedestrian trip generator (schools, parks, senior centers, hospitals, commercial areas, etc.) on both sides of the street between controlled intersections.

Treatment requirements and recommendations for mid-block crossings can be found in **Section 4.2**.

2.5 Crosswalks at Trail Crossings

At locations where a trail or a shared-use path crosses a street, the appropriate guidance for controlled intersection crossings, uncontrolled intersection crossings, and mid-block locations should be used to determine whether or not to mark a crosswalk, and to select the appropriate crossing treatments. Ramp receiving areas should be considered at all evaluation locations to determine the most appropriate crossing location. The City Traffic Engineer may consider, on a case-by-case basis, exceptions in regard to the following while determining whether to mark the trail/shared-use path crossing at uncontrolled locations:

- Crossing demand
- Distance to the nearest crosswalk

2.6 Prohibiting Pedestrian Crossings

Legal crosswalks exist at most roadway intersections, even if they are not marked. An unmarked crosswalk is a legal crossing unless local authorities place signs indicating otherwise. The CVC allows local authorities to prohibit pedestrian crossing with signage. Guidance based on the CVC and best practice is provided below.

GUIDANCE:

Signs may be installed at or adjacent to an intersection directing that pedestrians shall not cross in a marked or unmarked crosswalk at the intersection. It is unlawful for any pedestrian to cross at the crosswalk prohibited by a sign. Closures of existing crosswalks should be avoided, and existing closed crosswalks should be evaluated for opening in combination with any necessary safety measures such as signal timing or signage changes. Where required, only one leg of an intersection should be closed. The impact on pedestrian convenience and accessibility should be considered in these decisions.

The City Traffic Engineer may restrict certain pedestrian movements at any intersection. The following are examples where pedestrian crossing prohibition may be considered:

- Heavy right- or left-turn volumes cross the path of the pedestrian crossing and protected signal phasing to separate the movements is infeasible due to cost, lack of infrastructure, or other safety considerations.
- Physical environment or geometric conditions provide inadequate visibility.

3.0 EXISTING UNCONTROLLED MARKED CROSSWALKS

This chapter addresses the following aspects of existing uncontrolled marked crosswalk locations:

- When should City staff evaluate existing uncontrolled marked crosswalks?
- How to evaluate, and enhance or upgrade existing marked crosswalks where there is an opportunity to align the location with the most current guidelines?
- What if the enhancement/upgrade of an existing marked crosswalk is not feasible?
- Removal of existing marked crosswalk(s).

3.1 When Should The City Evaluate Existing Crosswalks?

These guidelines recognize that some existing marked crosswalks and associated inventories of traffic control devices may not comply with the guidelines, and/or applicable standards. The City of Sacramento is 170 years old and has developed a street network based on engineering standards that have evolved over time. The City has also inherited many streets and street designs developed by agencies other than the City of Sacramento.

Unless mandated by the pertinent regulatory/governing documents, such non-conforming pedestrian crossing facilities may remain in service through the end of their useful service life and/or until the inventories are depleted (See CA MUTCD, Introduction and Caltrans HDM, Chapter 80, Topic 82 for more information). As such, these guidelines do not suggest that the existing non-conforming pedestrian crossing facilities become obsolete upon adoption of these or any future updates/revisions to the guidelines, policies, procedures, and practices.

GUIDANCE:

As part of a proactive safety management process, it is recommended to consider evaluating and enhancing, when feasible, existing marked uncontrolled crosswalks and associated traffic control devices under one or more of the following conditions:

- As part of a project involving change in land use (e.g., school closure, development project, etc.).
- As part of a project involving a change in roadway characteristics (e.g., roadway widening, lane reduction, etc.).
- As part of a roadway resurfacing project.
- Based on pedestrian safety related concerns identified during the course of any traffic investigation.

3.2 Evaluation And Enhancement Approach

The approach for evaluation of an existing uncontrolled marked crosswalk, and enhancement of the same is suggested below.

GUIDANCE:

1. The existing crosswalk location should be documented and added to the City's crosswalk inventory database. At a minimum, the crosswalk documentation will include:
   - Marked crosswalk location
   - Site characteristics per the guidelines data collection form
   - Five-year pedestrian-crossing related crash history for the site
   - Potential for enhancement consistent with the guidance
2. Using the guidance presented in **Section 2** (page 3), determine the applicable roadway context classification of the crossing site and the recommended treatments for consideration.
3. Determine the appropriate additional treatment(s), if any, for the site using the treatment guidance in **Section 4** (page 23).
4. Compare the existing crosswalk and associated treatments with the recommended treatments. Determine if additional treatments are preferred for the crosswalk based on the guidelines.
5. If the evaluation of an existing uncontrolled marked crosswalk indicates that there is an opportunity for enhancements at the subject crosswalk based on the guidelines, take necessary measures, if feasible, to install the remaining components to enhance the crosswalk consistent with the guidelines.
6. The marked crosswalk characteristics and the enhancements made as part of the improvement should be added to the crosswalk inventory database to maintain a citywide inventory of known existing crosswalks. This update to the database entry should include the treatments, signage, or devices installed, the date of the most recent improvement(s), the reason for the improvement, and any additional relevant observations or data from the crosswalk site.

3.3 What If Enhancement Of An Existing Crosswalk Is Not Feasible?

These guidelines recognize that it may not be feasible to enhance every existing uncontrolled marked crosswalk based on these guidelines due to the financial constraints of public funds, extensive treatment requirements, the need for right-of-way acquisition, or other considerations.

GENERAL GUIDANCE

The CA MUTCD Section 3B.18 provides the following guidance in regard to new marked crosswalks at uncontrolled locations:

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.

In addition, Caltrans' Directive on Crosswalk Enhancements Policy (30) provides the following directions for minimum safety enhancements to existing marked crosswalks that cross uncontrolled roadways on the State Highway System with roadway characteristics that are similar to those addressed above:

Stage 1: Minimum Enhancements:

If a marked crosswalk exists across an uncontrolled intersection or mid-block location on the State Highway System where the speed limit exceeds 40 mph and the roadway has four or more lanes of travel and an ADT of 12,000 vehicles per day or greater, advanced yield lines with associated Yield Here to Pedestrian (R1-5, R1-5a) signs should be placed 20 to 50 feet in advance of the crosswalk, pedestrian crossing (W11-2) warning signs with diagonal downward pointing arrow (W16-7p) plaques should be installed at the crosswalk, and a high visibility crosswalk marking pattern should be used.

Stage 2: Additional Enhancements:

Other enhancements may be considered in conjunction with the minimum enhancements, based on engineering judgement or an engineering study (taking into account roadway characteristics, collision history, and pedestrian volumes) such as curb extensions, raised medians or pedestrian refuge islands, lighting, additional signing and marking, pedestrian actuated flashing beacons, pedestrian hybrid beacons or signalized control.

See the above referenced Policy Directive for further information.

Guidance for Enhancing Existing Uncontrolled Marked Crosswalks

This section documents the recommended approach to enhancing existing uncontrolled marked crosswalks where it may not be feasible to improve them to be consistent with the recommendations of these guidelines. These recommendations expand on the general guidance from the CA MUTCD and Caltrans' Directive on Crosswalks Enhancement Policy. Use of engineering judgement, as appropriate, is emphasized as an integral part of the entire process.

The recommended approach depends on roadway and traffic characteristics at the marked crosswalk site. The guidance has been separated into two different location types:

- Location Type 1 – Multi-Lane Roadways with Speed Limits ≥ 40 mph and ADT ≥ 12,000; and,
- Location Type 2 – All Other Crossing Locations

The two location types are based off the Caltrans' Directive on Crosswalk Enhancements Policy definition of when a marked crosswalk requires minimum enhancements on the State Highway System. Locations meeting the Caltrans Policy Directive criteria, Location Type 1, are not recommended to remain marked without interim improvements. Location Type 2 marked crosswalk locations may remain marked until enhancements can be provided on a case-by-case basis determined by the City Traffic Engineer.

GUIDANCE

Location Type 1 – Multi-Lane Roadways with Speed Limits ≥40 mph and ADT ≥ 12,000:

For roadways where pedestrians must cross three lanes or more in one direction, or four or more lanes in both directions, **and** the posted speed limit is at or above 40 mph and volumes are greater than or equal to 12,000 ADT, the following approach should be taken:

1. Review pedestrian crossing volumes, transit stop locations, surrounding land uses, and reported pedestrian crash history at or near the crossing within the last five years.
2. Evaluate the feasibility of providing interim improvements based on the data collected above and roadway configuration, vehicle volumes, vehicle speeds, and visibility.
3. If interim improvements are feasible at the site, implement appropriate interim improvements to reduce the risk of pedestrian involved crashes until such time when the recommended pedestrian crossing enhancements are in place.
4. If, based on the location, interim improvements are deemed insufficient to reduce the risk of pedestrian-involved crashes, and recommended improvements are not feasible due to cost or constructability, remove the crosswalk per the crosswalk removal guidance in the following subsection.
5. It is recommended to prohibit the crossing by removing traffic control devices associated with the crossing and implementing measures to prevent pedestrian crossings. Crosswalk prohibition should only be implemented as a last resort when interim enhancements are infeasible at the site or there are overriding safety considerations arising from the site conditions. Enhancements may be determined to be infeasible due to a number of considerations, such as cost, lack of infrastructure, or right of way limitations.
6. The evaluations and recommendations should be based on an engineering study before presenting for approval to the City Traffic Engineer. The City Traffic Engineer may consider an exception to this guidance on a case-by-case basis.

Location Type 2 – All Other Crossing Locations:

For other crossing locations, the following approach should be taken:

1. Review pedestrian crossing volumes, transit stop locations, surrounding land uses, and reported pedestrian crash history at or near the crossing within the last five years.
2. Evaluate the roadway configuration, vehicle volumes, vehicle speeds, and visibility for safety concerns related to the crossing location.
3. If there have been no pedestrian crashes at or near the crossing (within 250 feet) in the last five years and there are no visibility or other safety concerns determine if appropriate interim improvements can provide reduced crash risk to the pedestrians until such time when all the recommended pedestrian crossing enhancements are in place. Interim improvements should provide as enhanced a crossing experience as possible for pedestrians within the available resources.
4. The evaluations and recommendations should be based on an engineering study before presenting for approval to the City Traffic Engineer. The City Traffic Engineer may consider an exception to this guidance on a case-by-case basis.

Documentation

Evaluations and recommendations for the interim enhancement or, as a last resort, removal of an existing uncontrolled marked crosswalk should be documented to provide the justification for the crosswalk interim enhancements or removal. The documentation should include:

- existing roadway configuration, vehicle volumes, vehicle speeds, and visibility;
- pedestrian crossing volumes, transit stop locations, surrounding land uses, and reported pedestrian crash history at or near the crossing within the last five years;
- treatments recommended based on these guidelines;
- justification of interim improvements or crosswalk removal; and,
- potential funding sources and estimated timeline to improve the site.

3.4 Uncontrolled Marked Crosswalk Removal

Although, it may be necessary to remove an uncontrolled marked crosswalk due to the risk of crashes involving pedestrians at the location, it is important to note that such a removal does not prevent pedestrians from crossing the street at an intersection unless the crosswalk is prohibited. If there is a desire or need for pedestrians to cross at that location, based on the adjacent land uses, pedestrians may continue to cross at the location.

If a determination is made to remove an existing uncontrolled marked crosswalk, the removal of the crosswalk shall be accomplished in a manner consistent with the CA MUTCD and CVC Section 21950.5. The recommended approach for uncontrolled marked crosswalk removal is provided below.

GUIDANCE:

Marked crosswalk removal should be an exceptional case and crosswalk markings can be recommended for removal while leaving an unmarked crosswalk legally available when:

- an engineering evaluation determines that other measures have not been effective;
- there are overriding safety considerations arising from the site conditions; or,
- interim improvements are not feasible, and the recommended improvements are not feasible to implement in a reasonable timeline.

If it is determined to be necessary to remove an uncontrolled marked crosswalk for safety reasons, the removal should be consistent with CA MUTCD and CVC noticing requirements and City of Sacramento Crosswalk Removal Outreach Policy (see **Appendix B**). Consistent with CVC 21950.5 notification will be posted at the crosswalk identified for removal for not less than 30 days from the scheduled date of removal. Notices will also be posted at transit stops within 500-feet of the proposed crosswalk removal.

Marked crosswalk removal may be accomplished by repaving or surface treatment per the City of Sacramento Standard Specifications. A marked crosswalk should not be eliminated by allowing it to fade out or be worn away. Surface treatment for crosswalk removal should not give the appearance of a faded or worn away marked crosswalk to avoid the appearance of a marked crossing to a pedestrian at the curb. The City Traffic Engineer should confirm with Signs and Markings staff after crosswalk removal to determine the need for repaving or resurfacing based on whether the grinding of the removed crosswalk markings give the appearance of a faded or worn crosswalk. If this condition is not met, the crosswalk location should be resurfaced or repaved.

If a marked crosswalk is removed and prohibited, the crosswalk prohibition shall include signs installed at the location directing that pedestrians shall not cross consistent with CA MUTCD Section 3B.18 and CVC 21106(b). The City Traffic Engineer may approve additional treatments to reinforce the crosswalk prohibition such as barricades or pedestrian fencing on a case-by-case basis, as needed.

3.5 Prioritizing Enhancements for Existing Uncontrolled Marked Crosswalks

Given the potentially large number of existing marked crosswalks that may need enhancement treatments based on these guidelines and limits to available funding for enhancements, a prioritization methodology has been developed to allow the City to address enhancements to existing marked crosswalks. This approach creates a systematic process for identifying and prioritizing those locations for enhancements based on the locations that are most likely beneficial to people walking.

The recommended prioritization process considers site characteristics, crash history, the surrounding land use context of the site, and equity considerations to prioritize existing marked crosswalk locations for enhancements. The recommended prioritization process is described in the guidance below.

GUIDANCE

1. Begin the prioritization process by obtaining the latest version of the potential enhancement crosswalk inventory as described in **Section 3.2**.
2. Use the following scoring criteria to score each crosswalk where enhancements are being considered:
   - **Crash History:** If the site has a pedestrian crossing-related fatal or serious injury crash within the past five years, the site receives 3 points. If the site has a history of non-fatal or serious injury pedestrian crossing-related crashes, the location receives 2 points. If pedestrian crossing-related safety issues are observed at the site, but there is no pedestrian crossing-related crash history, the location receives 1 point.
   - **Demand:** If the site has pedestrian crossings volumes of at least 20 pedestrians per hour, or directly serves a pedestrian generator (as defined in **Section 2.2** above) the location receives 2 points. If the site indirectly serves a pedestrian generator, the location receives 1 point.
   - **Transit Stop:** If the site directly serves a transit stop or station, the location receives 2 points. If the location does not directly serve a transit stop or station but is within 500 feet of a transit stop or station, the location receives 1 point.
   - **Vision Zero High Injury Network:** If the site is on the Vision Zero High Injury Network as designated by the City, the location receives 1 point.
   - **School Zone:** If the site is within a school zone, the location receives 1 point.
   - **Equity:** If the site is within a disadvantaged community (as defined per Senate Bill 535 as within a Census Tract that is in the top 25% of CalEnviroScreen scores), the location receives 1 point.
3. Rank the crosswalk locations by score from highest to lowest.
4. Use the top 20% of the sites as the pool of locations for consideration, develop a short-list of projects for planning level evaluation based on available funding, geographic balance, implementation feasibility, upcoming resurfacing, repaving, or other maintenance activities, and engineering judgement.
5. Develop planning level cost estimates for the recommended improvements and interim improvements at each location for the selected sites.
6. Implement recommended or interim improvements in order of priority. Where recommended improvements are not able to be funded, implement interim improvements.
7. For sites where recommended or interim improvements are not able to be funded given current funding, identify potential funding sources.
8. If a site with an opportunity for enhancement consistent with the guidelines remains unfunded, the City Traffic Engineer may consider removing the marked crosswalk based on engineering judgement.
9. After a site has been enhanced consistent with the guidelines, remove the site from the potential enhancement crosswalk inventory database. Locations with interim improvements should remain in the database until no additional enhancements are recommended by the guidelines.

4.0 PEDESTRIAN CROSSING TREATMENT GUIDANCE

This chapter provides engineering guidance on designing marked pedestrian crossing facilities for uncontrolled and controlled crossing locations.

4.1 Treatments for Marked Crosswalks at Uncontrolled Locations

The design of marked pedestrian crossing facilities at uncontrolled locations in the City of Sacramento entails two major components:

- The 'basic' treatment as outlined in the subsection below; and
- pedestrian crossing facility enhancement(s) treatments to reduce the risk of pedestrian involved crashes and/or enhance the ability of pedestrians to cross the street.

BASIC TREATMENT FOR MARKED CROSSWALKS AT UNCONTROLLED LOCATIONS

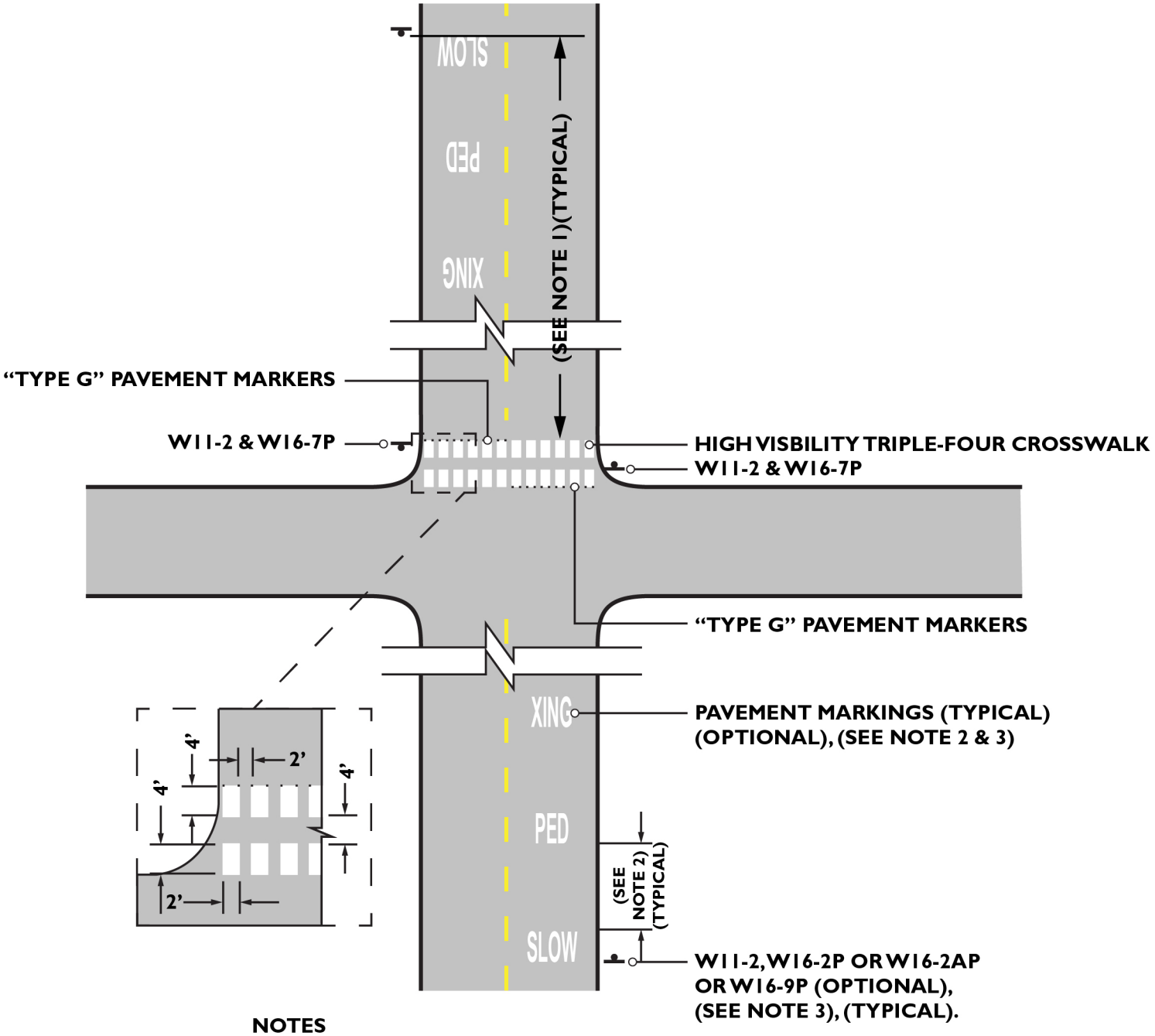
The 'basic' treatment as outlined below, and as depicted in **FIGURE 3** is to be provided at marked crosswalks at uncontrolled locations. The City Traffic Engineer may consider variations/exceptions on a case-by-case basis. Exercising engineering judgement is important in such cases, as it is impractical to address every possible scenario of site conditions at different crossing locations.

GUIDANCE

The 'basic' treatment for marked crosswalks at uncontrolled locations consists of:

- City's standard high visibility triple four crosswalk markings; and
- Warning signs W11-2 at the crossing location(s). If a W11-2 sign at the location of the crossing point is post-mounted, a diagonal downward pointing arrow (W16-7P) plaque shall be mounted below the W11-2 sign. If the W11-2 sign is mounted overhead, the (W16-7P) plaque shall not be used. Refer to CA MUTCD Section 2C.50 for further information.
- If the crosswalk location is across a roadway where the speed limit exceeds 40 mph and the roadway has four or more lanes of travel and an ADT of 12,000 vehicles per day or greater, advanced yield lines with associated Yield Here to Pedestrians (R1-5, R1-5a) signs should be placed 20 to 50 feet in advance of the crosswalk and adequate visibility should be provided by parking prohibitions. For parking restrictions, parking should be restricted to one stall or within the distance required to provide adequate stopping sight distance for approaching vehicles to stop for a pedestrian intending to cross, as well as one parking stall on the departure side.
- For all other locations, warning signs (W11-2) may be provided in advance of an uncontrolled marked crosswalks if an engineering judgement indicates that either there is a need for alerting road users in advance of where unexpected entries of pedestrian into the roadway might occur, **OR** where visibility of the crossing treatments or pedestrians is obstructed. Obstructions may include near side transit stops, trees, visual clutter, roadway geometry that limits sight distance, a large volume of heavy vehicles, etc.
- If the warning sign (W11-2) is used in advance of a pedestrian crossing (see above), it should be supplemented with plaques with the legend "AHEAD" or "XX FEET".
- "SLOW PED XING" pavement word markings should be provided in conjunction with W11-2 warning signs if the W11-2 signs are provided in advance of the uncontrolled marked crosswalk to supplement the signs and provide additional emphasis for the warning messages. For trail crossings, "SLOW TRAIL XING" pavement markings should be used instead of "SLOW PED XING".
- For streets with multiple uncontrolled marked crossings in series, excessive use of the signs and pavement markings should be avoided in order to ensure the effectiveness as well as the conservative use of these traffic control devices. Depending on site conditions, select appropriate locations to consolidate/minimize the locations of advanced warning signs (W11-2) and associated "SLOW PED XING" pavement word markings.

FIGURE 3 Uncontrolled Marked Crosswalk 'Basic' Treatment



NOTES

1. SELECT THE ADVANCE PLACEMENT DISTANCE BASED ON DESIGN SPEEDS.
2. REFER TO 2014 CA MUTCD (OR LATEST EDITION), SECTION 3B.20 FOR LETTER SIZE AND LONGITUDINAL SPACE BETWEEN PAVEMENT MARKINGS.
3. FOR WARNING SIGNS (W11-2) AND "SLOW PED XING' PAVEMENT MARKINGS IN ADVANCE OF UNCONTROLLED MARKED CROSSINGS, REFER TO SECTION 4.2 FOR GUIDANCE ON:
   (A) APPLICABILITY; AND
   (B) CONSOLIDATION OF LOCATIONS OF THESE SIGNS AND PAVEMENT MARKINGS FOR STREETS WITH MULTIPLE UNCONTROLLED MARKED CROSSINGS IN SERIES.

W11-2

W16-2AP

W16-7P

W16-9P

Source: City of Sacramento, 2014.

Enhancement Treatments for Marked Crosswalks at Uncontrolled Locations

Marked crosswalks at uncontrolled locations may need to be enhanced with appropriate treatments (depending on the roadway and traffic characteristics of the crossing location) to reduce the risk of crashes involving pedestrians and/or enhance the ability of pedestrians to cross the street. To achieve those two outcomes, pedestrian crossings often use several traffic control devices or design elements to meet the information and control needs of both motorists and pedestrians. The following characteristics are desirable for a pedestrian crossing:

- The street crossing task is simple and convenient for pedestrians.
- Waiting or crossing pedestrians are visible to motorists and pedestrians can see approaching vehicles.
- Vehicle speeds are slowed or controlled in the area of the pedestrian crossing.
- Vehicle drivers are aware of the presence of the crosswalk.
- Vehicle drivers yield the right-of-way to pedestrians.
- Pedestrians use designated crossing locations and obey applicable state and local traffic laws.

In a complex (e.g., multi-lane, high-speed, high-volume) street environment, it can be difficult to provide these characteristics with a single treatment, and these environments may require several treatments intended to serve different purposes. Streets with lower speeds or traffic volumes may not require multiple treatments to achieve the desirable characteristics above.

The guidance in this section for selecting enhancement treatments for marked crosswalks at uncontrolled locations is based on the 2018 *FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations*. The FHWA document provides guidance on specific aspects such as the effectiveness and/or applicability of various treatments under different combinations of roadway and traffic conditions based on the latest research and best practices of 2021. The City of Sacramento guidance uses the FHWA guide as its basis, while tailoring the guidance to fit the unique context of the City.

GUIDANCE:

These guidelines are intended to provide a balance between engineering judgement and prescriptiveness. Although the recommendations presented in this section provide guidance in selecting appropriate pedestrian crossing treatments, engineering judgement should be exercised in selecting a specific treatment(s) for installation.

PRIMARY ENHANCEMENTS

Nine primary treatments are recommended for pedestrian crossing enhancements based on FHWA's 2018 guidance for marked uncontrolled crossing locations. The primary enhancements include:

1. High-visibility crosswalk markings with parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs
2. Raised crosswalks
3. Advance Yield Here to Pedestrians signs and yield lines
4. In-street Pedestrian Crossing signs
5. Curb extensions
6. Pedestrian refuge islands
7. Rectangular Rapid-Flashing Beacons (RRFBs)
8. Road diets
9. Pedestrian Hybrid Beacons (PHBs)

Recommended primary enhancement treatments by roadway configuration, posted speed, and average daily traffic are presented in **TABLE 3.** (see page 28). The recommended treatments are determined by the roadway and traffic characteristics of the crossing site.

The primary treatment recommendations are provided in three categories for each matrix cell:

- Treatments that are **candidates** for the location type;
- Treatments that should **always be considered**, but are not mandated or required (shown as a **bolded number in a darkened box**);
- Crosswalk visibility enhancements that should always occur in conjunction with other identified treatments (shown as a **bolded number in a darkened box with a black outline**)

Where a treatment is not represented in a matrix cell, it is not recommended for use at sites meeting those conditions.

Not all of the treatments listed in a matrix cell should necessarily be installed at the crossing. The observations and results from the location screening and data collection phases should be used to help determine which treatments seem most likely to be effective at reducing risk of crashes involving pedestrians.

Additionally, the surrounding land use context, pedestrian volumes and activity patterns, and treatment effectiveness and cost should be considered when selecting the treatment most suitable for the crossing.

For multi-lane roadway crossings where vehicle ADT exceeds 10,000, FHWA guidance has established that **a marked crosswalk alone is typically not sufficient**[1]. When these conditions are met, more substantial crossing treatments should be used to prevent an increase in pedestrian crash potential. Treatments such as a pedestrian refuge island, RRFB, or PHB may be considered. Refer to the **TABLE 3** matrix for when a marked crosswalk (Treatment #1) should be paired with one or more of the other treatments (shown in **bold with a darker background**). Additionally, substantial crossing treatments such as traffic signals or pedestrian signals should also be considered at these locations when warranted and could help reduce the risk of crashes involving pedestrians.

To improve the visibility of the marked crossing and pedestrians, multiple treatments may be combined. Roadway geometry and CA MUTCD requirements should be considered when considering installing multiple treatments.

The companion Pedestrian Crossing Treatments Application Guide provides more information on the primary treatments.

SUPPLEMENTAL TREATMENTS

Supplemental treatments may be potentially useful as supplements or add-ons to the City's basic treatment and/or primary treatments. The companion document City of Sacramento Pedestrian Crossing Treatment Applications Guide provides guidance on the primary and supplemental treatments including pertinent requirements.

NEW TREATMENTS

The treatments recommended in these guidelines reflect the more common treatments being used and may not include every treatment available. Furthermore, the City of Sacramento's practice is to use only those traffic control devices that are approved for use in California. Accordingly, only those treatments and devices that are either included in the CA MUTCD or approved for their use by the CTCDC at the time of development of these guidelines are included as the recommended treatments. With advancements in technology, new treatments and devices may become available in the future. The City Traffic Engineer may approve the use of such treatments and devices if they meet the requirement above consistent with the powers and duties defined in the Sacramento City Code, Section 10.80.040.

1 FHWA Guide to Improving Pedestrian Safety at Uncontrolled Locations, 2018.

TABLE 3 Application of Pedestrian Crossing Treatments by Location Type

Roadway Configuration	Posted Speed Limit and ADT																								
	Vehicle ADT <9,000									Vehicle ADT 9,000-15,000									Vehicle ADT >15,000						
	≤30 mph			35 mph			≥40mph			≤30 mph			35 mph			≥40mph			≤30 mph			35 mph			≥40mph		
2 lanes	**1**	2		**1**		3	**1**		3	**1**			1		3	**1**		3	**1**			**1**		3	**1**		3
	4	5	6		5	6		5	6	4	5	6		5	6		5	6	4	5	6		5	6		5	6
				7		9	**7**		**9**				7		9	**7**		**9**	7		9	7		9			**9**
2 lanes one-way	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5			**5**			**5**			**5**			**5**			**5**			**5**			**5**			**5**	
	7		9	7		9	7		**9**	7		9	**7**		**9**	**7**		**9**	**7**		9	7		**9**			**9**
3 lanes with raised median	**1**	2	3	**1**		**3**	**1**		**3**	**1**		3	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
	4	5			5			5		4	5			5			5		4	5			5			5	
				7		9	**7**		**9**	7		9	**7**		**9**	**7**		**9**	7		9	**7**		**9**			**9**
3 lanes without raised median	**1**	2	3	**1**		**3**	**1**		**3**	**1**		3	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
	4	5	6		5	6		5	6	4	**5**	6		5	6		5	6	4	5	6		5	6		5	6
	7		9	7		9	7		**9**	7		9	**7**		**9**	7		**9**	7		9			**9**			**9**
3 lanes one-way	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5			**5**			**5**			**5**			**5**			**5**			5			**5**			**5**	
	7	8	9	7	8	9	7	8	**9**	7	8	9	**7**	8	**9**	7	8	**9**	**7**	8	**9**		8	**9**		8	**9**
4+ lanes with raised median	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5			**5**			**5**			**5**			**5**			**5**			**5**			**5**			**5**	
	7	8	9	7	8	**9**	7	8	**9**		8	9	**7**	8	**9**		8	**9**	**7**	8	**9**		8	**9**		8	**9**
4+ lanes without raised median	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**	**1**		**3**
		5	6		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**		5	**6**
	7	8	9	7	8	9		8	**9**		8	9	**7**	8	**9**		8	**9**	**7**	8	**9**		8	**9**		8	**9**

Treatments:

1. High-visibility crosswalk markings, parking restrictions on crosswalk approach, adequate nighttime lighting levels, and crossing warning signs.

2. Raised crosswalk

3. Advance Yield Here to (Stop Here For) Pedestrians sign and yield (stop line)

4. In-Street Pedestrian Crossing sign

5. Curb extension

6. Pedestrian refuge island

7. Rectangular Rapid-Flashing Beacon (RRFB)**

8. Road Diet

9. Pedestrian Hybrid Beacon (PHB)**

Selection Guidance:

#: treatments that are candidates for the location type

#: treatments shown as a bold number within a darkened box should always be considered, but are not mandated or required.

: treatments shown as a bolded number in a darkened box with a black outline are crosswalk visibility enhancements that should always occur in conjunction with other identified treatments.

** Note: The PHB and RRFB are not installed at the same crossing location

Source: Adapted from FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (July 2018)

4.2 Crosswalks at Mid-Block

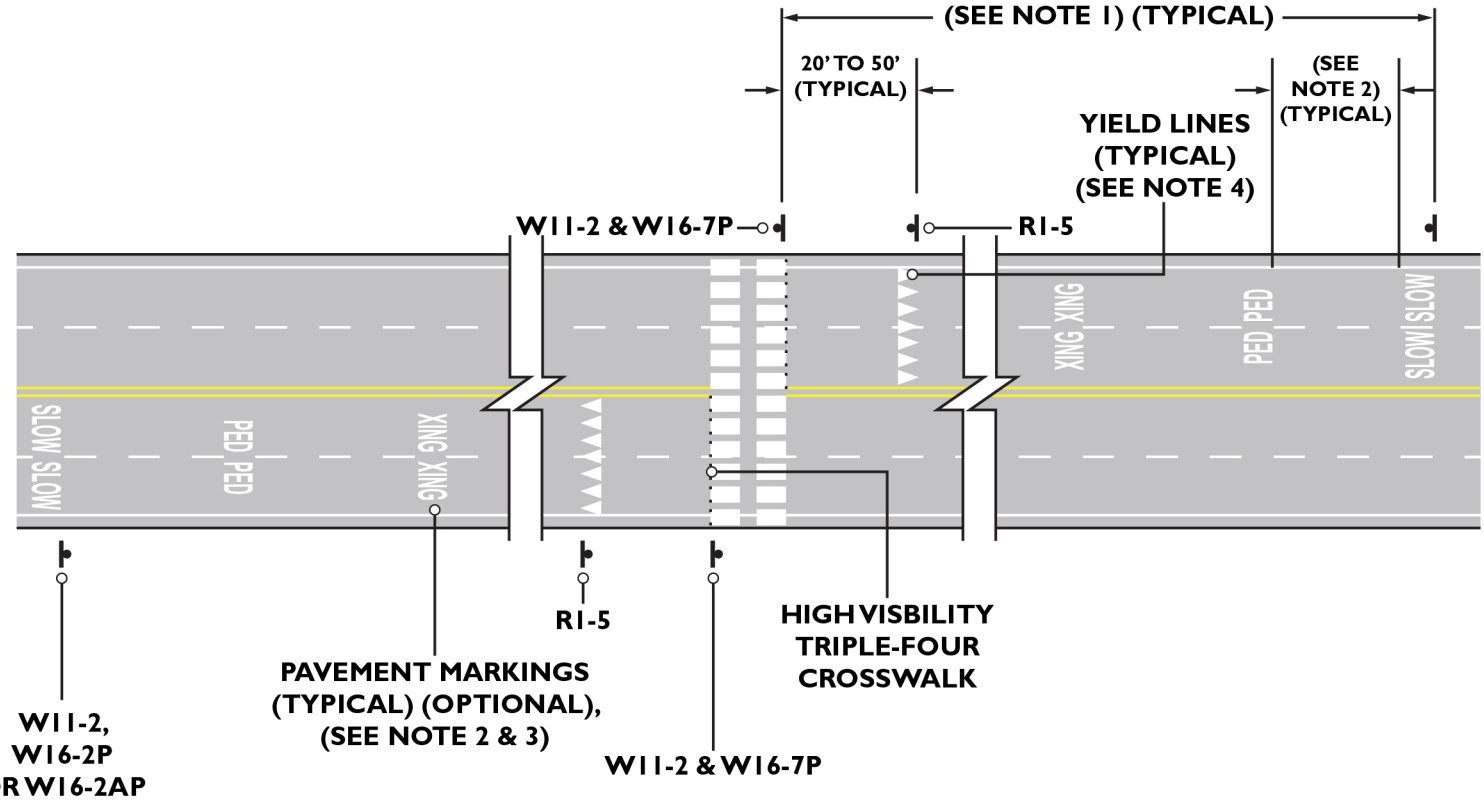
Guidance for the design of marked pedestrian crossing facilities at uncontrolled mid-block locations is provided below.

GUIDANCE:

If an uncontrolled mid-block location is selected for a marked crosswalk in accordance with the guidelines in **Section 2**, the location should be provided with the following treatments (see **FIGURE 4** for details):

- City's standard high visibility triple four crosswalk markings;
- Advanced yield lines with associated "Yield Here to Pedestrians" (R1-5, R1-5a) signs should be placed 20 to 50 feet in advance of the crosswalk for mid-block crossings and parking should be prohibited between the yield lines and the crosswalk. Additionally, parking should be restricted to one stall or within the distance required to provide adequate stopping sight distance for approaching vehicles to stop for a pedestrian intending to cross, as well as one parking stall on the departure side.
- Warning signs W11-2 at the crossing location(s). If a W11-2 sign at the location of the crossing point is post-mounted, a diagonal downward pointing arrow (W16-7P) plaque shall be mounted below the W11-2 sign. If the W11-2 sign is mounted overhead, the (W16-7P) plaque shall not be used. Refer to CA MUTCD Section 2C.50 for further information.
- Warning signs (W11-2) may be provided in advance of an uncontrolled marked crosswalk if engineering judgement indicates that either there is a need for alerting road users in advance of where unexpected entries of pedestrians into the roadway might occur, **OR** where visibility of the crossing treatments or pedestrians is obstructed. Obstructions may include near side transit stops, trees, visual clutter, roadway geometry that limits sight distance, a large volume of heavy vehicles, etc.
- If the warning sign (W11-2) is used in advance of a pedestrian crossing (see above), it should be supplemented with plaques with the legend "AHEAD" or "XX FEET".
- "SLOW PED XING" pavement word markings should be provided in conjunction with W11-2 warning signs if the W11-2 signs are provided in advance of the uncontrolled marked crosswalk to supplement the signs and provide additional emphasis for the warning messages. For trail crossings, "SLOW TRAIL XING" pavement markings should be used instead of "SLOW PED XING".
- Pedestrian crossing enhancement treatments as recommended in **TABLE 3** (page 28).

FIGURE 4 Uncontrolled Marked Crosswalk 'Basic' Treatment at Mid-Block Locations



W11-2 W16-2AP

W16-7P W16-9P

R1-5

NOTES

1. SELECT THE ADVANCE PLACEMENT DISTANCE BASED ON DESIGN SPEEDS.
2. REFER TO 2014 CA MUTCD (OR LATEST EDITION), SECTION 3B.20 FOR LETTER SIZE AND LONGITUDINAL SPACE BETWEEN PAVEMENT MARKINGS.
3. FOR WARNING SIGNS (W11-2) AND "SLOW PED XING' PAVEMENT MARKINGS IN ADVANCE OF UNCONTROLLED MARKED CROSSINGS, REFER TO SECTION 4.2 FOR GUIDANCE ON:
   (A) APPLICABILITY; AND
   (B) CONSOLIDATION OF LOCATIONS OF THESE SIGNS AND PAVEMENT MARKINGS FOR STREETS WITH MULTIPLE UNCONTROLLED MARKED CROSSINGS IN SERIES.
4. (A) PARKING SHOULD BE PROHIBITED BETWEEN YIELD LINES AND MARKED CROSSWALK.
   (B) FOR STREETS WITH ONLY ONE LANE IN DIRECTION, THE USE OF ADVANCE YIELD LINE AND PROHIBITION OF PARKING BETWEEN YIELD LINE AND CROSS WALK IS NOT REQUIRED.

Source: City of Sacramento, 2014.

4.3 Crosswalks at Trails or Shared-Use Paths

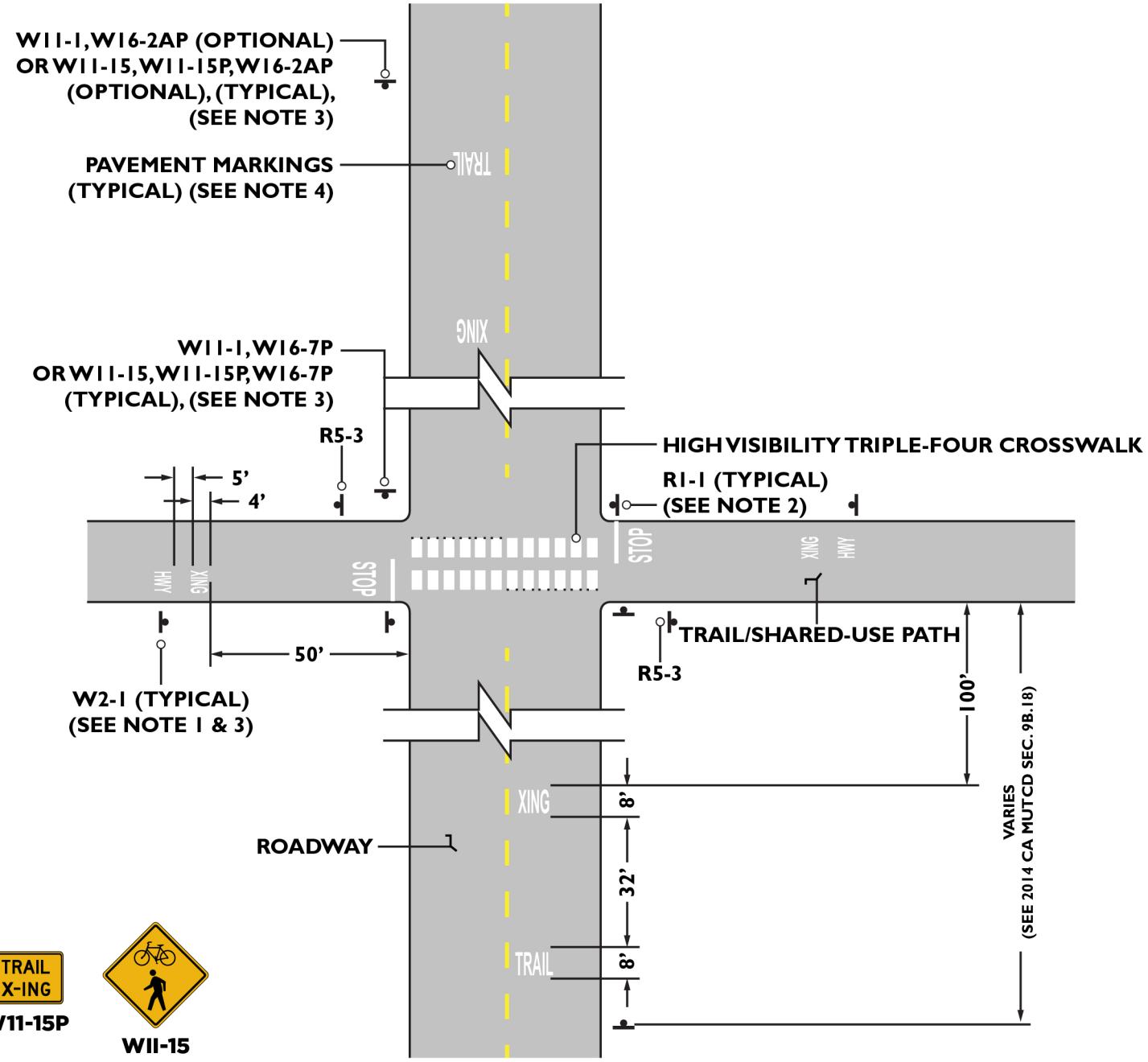
Guidance for the design of marked crosswalks at a trail or shared-use path at an uncontrolled location is provided below.

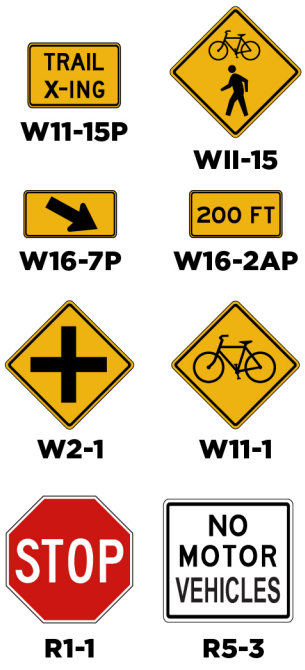
GUIDANCE:

If a determination is made to provide a marked crossing for a trail or a shared-use path at an uncontrolled location, the crossing location should be provided with the following treatments (see Figure 5 for details):

- City's 'basic' treatment as outlined above with the following additional considerations. CA MUTCD Section 9B.16 should be consulted for guidance on the use and applicability of intersection warning signs (W2-1 through W2-5) in advance of a shared- use path / roadway intersection. CA MUTCD Section 9B.18 should be consulted for guidance on the use and applicability of Bicycle Warning sign (W11-1), and combination Bicycle / Pedestrian (W11-15) signs in advance of, and at a path crossing including the use of applicable supplemental plaques. See **FIGURE 5** for details.
- Pedestrian crossing enhancement treatments as recommended in **TABLE 3** (page 28). Refer to the previous subsection for more detailed guidance on selecting pedestrian crossing enhancement treatments.

FIGURE 5 Uncontrolled Marked Crosswalk 'Basic' Treatment at Trail or Shared-Use Path Locations





NOTES

1. INSTALL W2-1 SIGN IF NO STOP, YIELD, OR SIGNAL CONTROL ON PATH.
2. INTERSECTION TRAFFIC CONTROL DEVICES MIGHT BE STOP OR YIELD SIGNS FACING SHARED-USE PATH APPROACHES, ROADWAY APPROACHES, OR BOTH, DEPENDING ON CONDITIONS (SEE 2014 CA MUTCD (OR LATEST EDITION), SEC. 9B.03)
3. FOR GUIDANCE ON WARNING SIGNS W2 SERIES, AND W11-1 / W11-15 INCLUDING APPLICABLE SUPPLEMENTAL PLAQUES, REFER TO 2014 CA MUTCD (OR LATEST EDITION), SECTION 9B.16, AND 9B.18 RESPECTIVELY.
4. FOR GUIDANCE ON PAVEMENT WORD, AND SYMBOL MARKINGS, REFER TO 2014 CA MUTCD (OR LATEST EDITION), SECTION 3B.20.

Source: City of Sacramento, 2014.

4.4 Crosswalks at Controlled Locations

The recommended guidelines for marking crosswalks at signalized and stop or yield controlled locations are presented in the two subsections below, respectively.

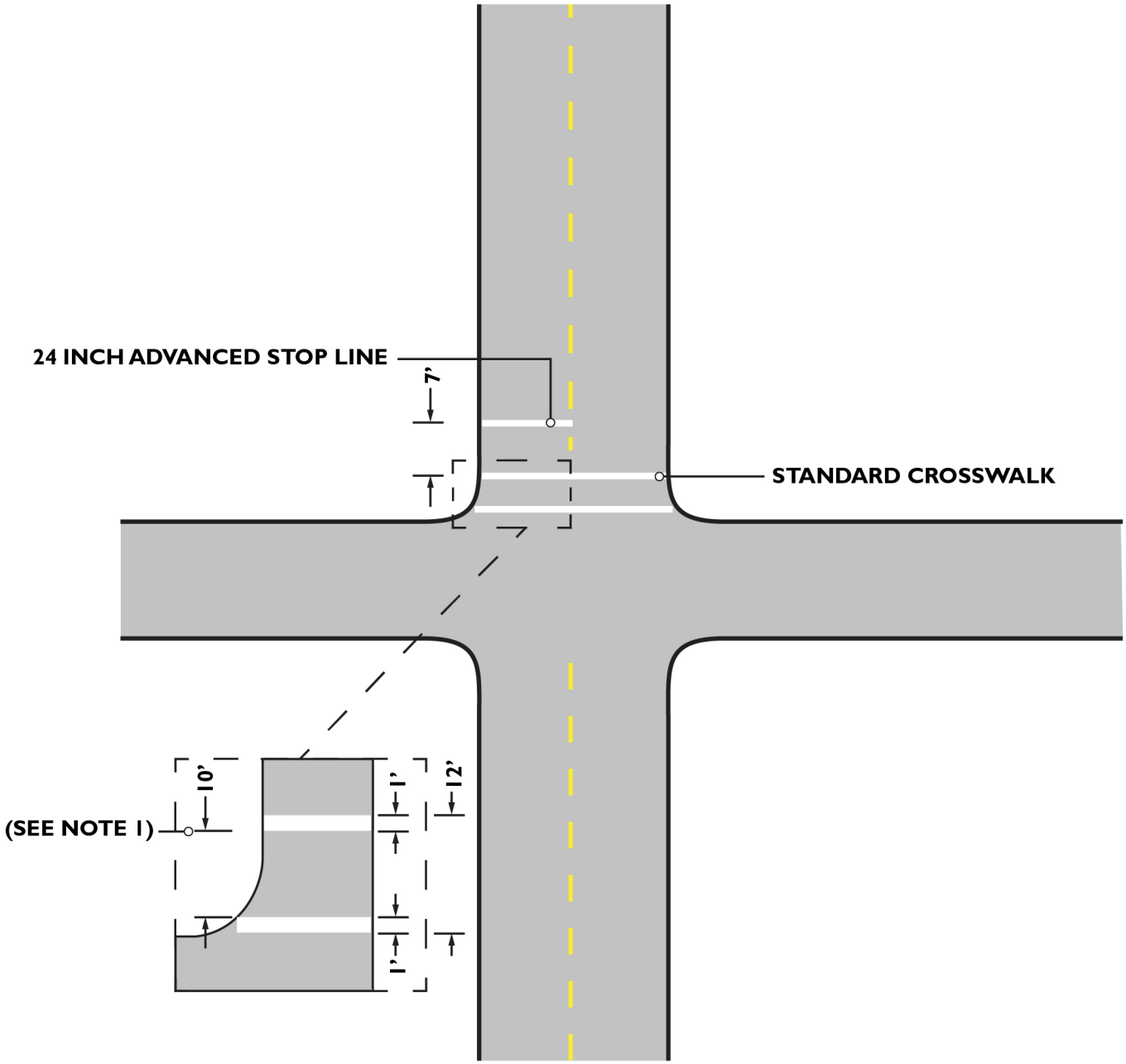
Signalized Intersections

These guidelines recommend the following approach for marking crosswalks at signalized intersections (see **FIGURE 6** for details).

GUIDANCE:

- Provide marked crosswalks on each approach of the signalized intersection unless a pedestrian crossing is prohibited. See **Section 2.6** for more detailed guidance on crossing prohibitions.
- The marked crosswalks should be 12 feet wide with a 10 feet inside clear space. The City Traffic Engineer may consider approving lesser space on a case-by-case basis, provided it is not less than 6 feet. See CA MUTCD Section 3B.18 for more information.
- It is recommended to install a 24-inch advanced stop line seven feet in advance of the crosswalk on each approach to a signalized intersection.
- High visibility crossing markings, including the City's standard high visibility triple four crosswalk markings, should be considered on a case-by-case basis at signalized crossings serving a school zone, transit stops and stations, a corridor on the Vision Zero High-Injury Network, and locations with heavy pedestrian volumes as determined by engineering judgement. Different high visibility markings may be used to differentiate controlled crossing types or contexts.
- Supplemental hardware and operational treatments may be considered for signalized crossing locations. Information on the supplemental hardware and operational treatments to help achieve optimal pedestrian crossing service is covered in this guidance's companion document *Pedestrian Crossing Guidelines Treatments Application Guide*.

FIGURE 6 Marked Crosswalk Treatment at a Signalized Crossing Location



NOTES

1. MARKED CROSSWALKS SHOULD BE 12 FEET WIDE WITH A 10 FEET INSIDE CLEAR SPACE. THE CITY TRAFFIC ENGINEER MAY CONSIDER USING A LESSER SPACE PROVIDED IT IS NOT LESS THAN 6 FEET.

Stop- or Yield-Controlled Locations

These guidelines recommend the following approach for marking crosswalks at stop- or yield-controlled intersections (see **FIGURE 7** and **FIGURE 8** for details, respectively).

GUIDANCE:

Stop-Controlled Locations

- Install marked crosswalks if recommended by the City Traffic Engineer, otherwise, install only a 12-inch wide limit line with associated traffic control devices (e.g. signs, pavement markings, etc.) consistent with CA MUTCD. The City may consider marking the crosswalks at stop-controlled locations based on engineering judgement.
- The marked crosswalks (if provided) should be 12 feet wide with a 10 foot inside clear space and be provided with associated traffic control devices (e.g., signs, pavement markings, etc.) consistent with CA MUTCD. The City Traffic Engineer may consider approving less clear space on a case-by-case basis, provided it is not less than 6 feet.
- If a marked crosswalk is to be provided, the City's standard high visibility triple four crosswalk markings should be considered on a case-by-case basis at stop-controlled crossings serving school walking routes, transit stops and stations, and based on pedestrian volumes. Use of these markings will be determined by engineering judgement.
- A limit line at a stop-controlled approach is not required where a marked crosswalk exists but may be considered on a case-by-case basis as determined by engineering judgement.

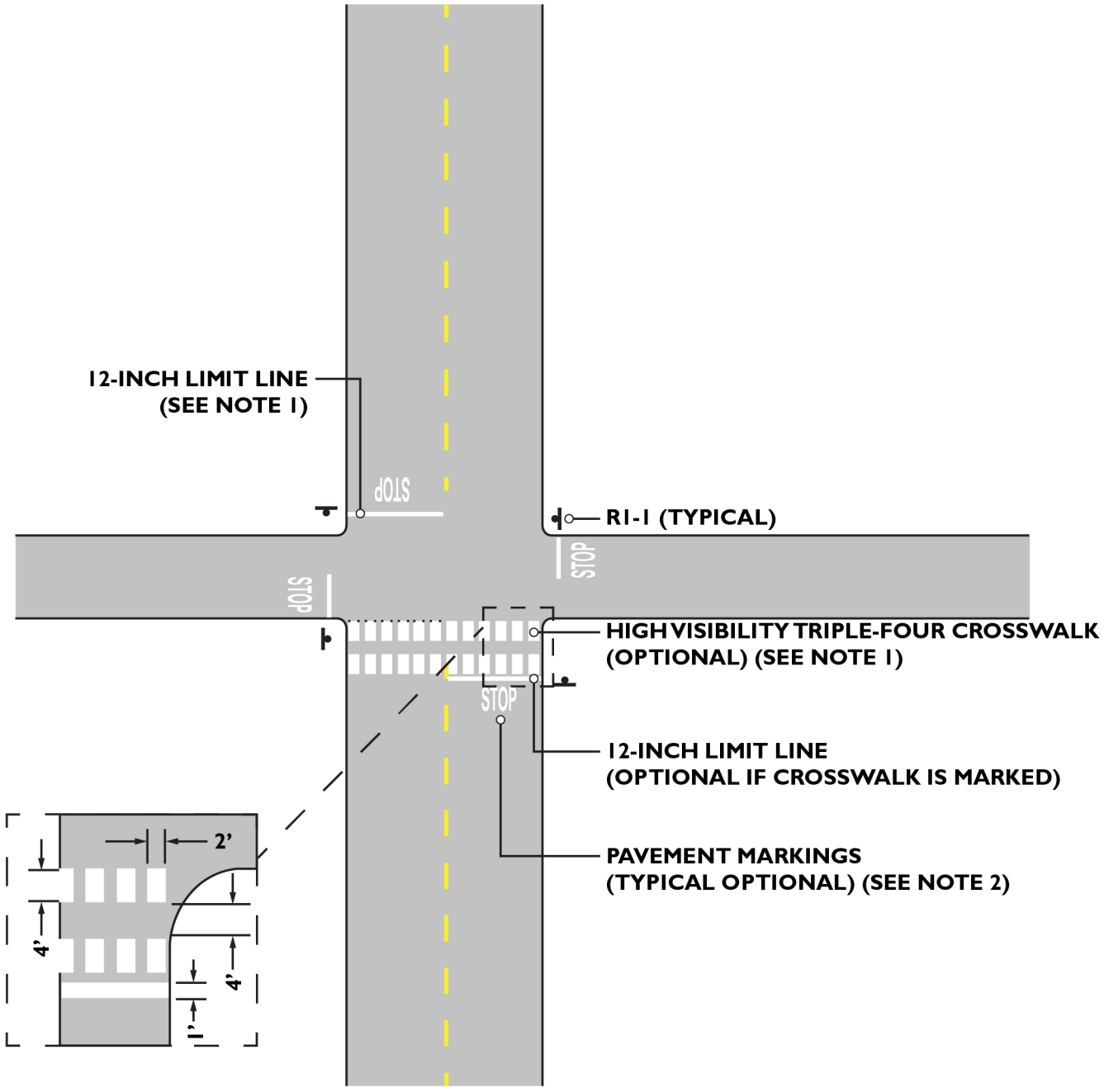
Yield-Controlled Locations

- Install marked crosswalks if recommended by the City Traffic Engineer, otherwise, install a yield line with associated traffic control devices (e.g. signs, pavement markings, etc.) consistent with CA MUTCD. The City may consider marking the crosswalks at yield-controlled locations based on engineering judgement.
- Marked crosswalks (if provided) should be 12 feet wide with a 10 feet inside clear space and the yield-controlled approach be provided with associated traffic control devices (e.g., signs, pavement markings, etc.) consistent with CA MUTCD. The City Traffic Engineer may consider approving less clear space on a case-by-case basis, provided it is not less than 6 feet.
- Yield-controlled pedestrian crossings may exist under a wide range of site conditions, and the City Traffic Engineer may need to consider modifications to the crossing treatments recommended above based on engineering judgement on a case-by-case basis.

Additional Guidance for Stop- or Yield-Controlled Locations

- The treatments presented above cover the basic information on marking the crosswalks at the stop or yield controlled intersections. Refer to the following sections of the CA MUTCD for guidance related to crossing facilities at these locations, as needed: Section 3B.16 (Stop and Yield Lines), Section 3B.18 (Crosswalk Markings) and Section 3B.20 (Pavement Word, Symbol, and Arrow Markings).

FIGURE 7 Marked Crosswalk Treatment at a Stop-Controlled Crossing Location

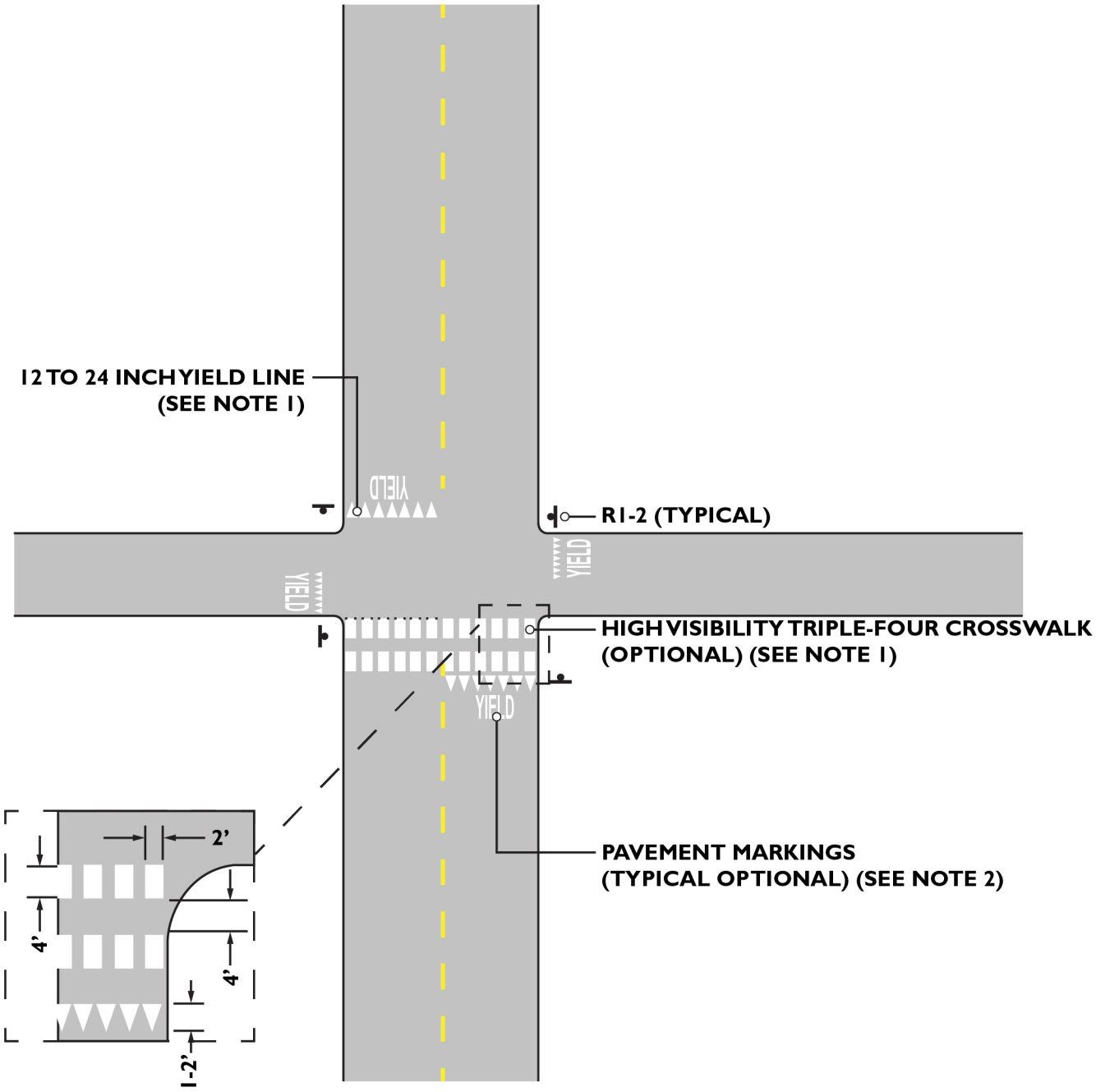


R1-1

NOTES

1. CROSSWALKS MAY BE MARKED AT A STOP-CONTROLLED LOCATION USING THE CITY'S STANDARD HIGH VISIBILITY CROSSWALK MARKINGS.
2. REFER TO 2014 CA MUTCD (OR LATEST EDITION), SECTION 3B.20 FOR LETTER SIZE AND LONGITUDINAL SPACE BETWEEN PAVEMENT MARKINGS

FIGURE 8 Marked Crosswalk Treatment at a Yield-Controlled Crossing Location



R1-2

NOTES

1. CROSSWALKS MAY BE MARKED AT A YIELD-CONTROLLED LOCATION USING THE CITY'S STANDARD HIGH VISIBILITY CROSSWALK MARKINGS.
2. REFER TO 2014 CA MUTCD (OR LATEST EDITION), SECTION 3B.20 FOR LETTER SIZE AND LONGITUDINAL SPACE BETWEEN PAVEMENT MARKINGS


ONE WAY

APPENDICES

Appendix A – Crosswalk Basics and Key Definitions

Function of Crosswalks

Marked crosswalks serve multiple purposes; they:

- provide guidance for pedestrians who are crossing roadways by defining and delineating paths to and within the controlled intersections;
- alert road users (in conjunction with signs and other traffic control devices) of a designated pedestrian crossing point across roadways at locations that are uncontrolled; and,
- legally establish the crosswalk at non-intersection locations (adapted from CA MUTCD, Section 3B.18.).

The following relevant legal statutes are contained in the CVC.

Section 275 defines a crosswalk as:

275 "Crosswalk" is either:

(a) That portion of a roadway included within the prolongation or connection of the boundary lines of sidewalks at intersections where the intersecting roadways meet at approximately right angles, except the prolongation of such lines from an alley across a street.

(b) Any portion of a roadway distinctly indicated for pedestrian crossing by lines or other markings on the surface.

Notwithstanding the foregoing provisions of this section, there shall not be a crosswalk where local authorities have placed signs indicating no crossing.

Section 21950 describes right-of-way at a crosswalk:

(a) The driver of a vehicle shall yield the right-of-way to a pedestrian crossing the roadway within any marked crosswalk or within any unmarked crosswalk at an intersection.

(b) This section does not relieve a pedestrian from the duty of using due care for his or her safety. No pedestrian may suddenly leave a curb or other place of safety and walk or run into the path of a vehicle which is so close as to constitute an immediate hazard. No pedestrian may unnecessarily stop or delay traffic while in a marked or unmarked crosswalk.

(c) The driver of a vehicle approaching a pedestrian within any marked or unmarked crosswalk shall exercise all due care and shall reduce the speed of the vehicle or take any other action relating to the operation of the vehicle as necessary to safeguard the safety of the pedestrian.

(d) Subdivision (b) does not relieve a driver of a vehicle from the duty of exercising due care for the safety of any pedestrian within any marked crosswalk or within any unmarked crosswalk at an intersection.

Section 21955 pertains to crossing between controlled intersections:

Between adjacent intersections controlled by traffic control signal devices or by police officers, pedestrians shall not cross the roadway at any place except in a crosswalk.

Key Definitions

The meanings of following words and phrases when used in this document are explained below:

AVERAGE DAILY TRAFFIC (ADT)
The average 24-hour volume, being the total volume during a stated period divided by the number of days in that period. Normally, this would be periodic daily traffic volumes over several days, not adjusted for days of the week or seasons of the year. (CA MUTCD Section 1A.13)

CONTROLLED INTERSECTION
A controlled intersection is one where each approach to the intersection is regulated by a traffic signal, stop, or yield traffic control device.

CRITICAL GAP
The time in seconds below which a pedestrian will not attempt to begin crossing the street.

CROSSWALK LINES
White or yellow (in school areas per CVC 21368) pavement marking lines that identify a crosswalk. (CA MUTCD Section 1A.13)

LIMIT LINE
A solid white line not less than 12 nor more than 24 inches wide, extending across a roadway or any portion thereof to indicate the point at which traffic is required to stop in compliance with legal requirements. (CA MUTCD Section 1A.13)

MARKED CROSSWALK
A pedestrian crossing delineated by crosswalk lines.

MEDIAN
The area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges, and at opposite approaches of the same intersection. (CA MUTCD Section 1A.13)

MOTORIST COMPLIANCE
Percent of motorists yielding or stopping for pedestrians.

MULTI-LANE
More than one lane moving in the same direction. A multi-lane street, highway, or roadway has a basic cross-section comprised of two or more through lanes in one or both directions. A multi-lane approach has two or more lanes moving toward the intersection, including turning lanes. (CA MUTCD Section 1A.13)

MULTIPLE THREAT CRASHES
A multiple-threat crash involves a driver stopping in one lane of a multilane road to permit pedestrians to cross, and an oncoming vehicle (in the same direction) strikes the pedestrian who is crossing in front of the stopped vehicle. This crash type involves both the pedestrian and driver failing to see each other in time to avoid the collision.

PEDESTRIAN
A person on foot, in a wheelchair, on a non-motorized scooter, on skates, or on a skateboard. As per CVC 467, (a) A "pedestrian" is a person who is afoot or who is using any of the following: (1) A means of conveyance propelled by human power other than a bicycle. (2) An electric personal assistive mobility device. (b) "Pedestrian" includes a person who is operating a self-propelled wheelchair, motorized tricycle, or motorized quadricycle and, by reason of physical disability, is otherwise unable to move about as a pedestrian, as specified in subdivision(a). (CA MUTCD Section 1A.13)

STOP LINE
A solid white pavement marking line extending across approach lanes to indicate the point at which a stop is intended or required to be made. For all purposes, limit line(s) as defined per CVC 377 shall mean stop line(s). (CA MUTCD Section 1A.13)

TRAFFIC CONTROL DEVICE
A sign, signal, marking, or other device used to regulate, warn, or guide traffic, placed on, over, or adjacent to a street, highway, private road open to public travel, pedestrian facility, or shared-use path by authority of a public agency or official having jurisdiction, or, in the case of a private road open to public travel, by authority of the private owner or private official having jurisdiction. (CA MUTCD Section 1A.13)

YIELD LINE
A row of solid white isosceles triangles pointing toward approaching vehicles extending across approach lanes to indicate the point at which the yield is intended or required to be made. (CA MUTCD section 1A.13)

85TH PERCENTILE SPEED
The speed at or below which 85 percent of the motor vehicles travel. (CA MUTCD section 1A.13)

Appendix B – City of Sacramento Crosswalk Removal Outreach Policy

City of SACRAMENTO
Department of Public Works

Transportation Division
915 I Street, RM 2000
Sacramento, CA 95814
Phone: 916-808-5307

MEMORANDUM

TO: Transportation Division

FROM: Ryan Moore, PE, TE, City Traffic Engineer RTM

SUBJECT: Crosswalk Removal Outreach Policy

DATE: June 8, 2018

Purpose:

To establish Transportation Division policy and procedures related to informing the public about proposed marked crosswalk removal.

Policy:

Public Works Transportation Division staff will conduct the following actions when noticing of a proposed marked crosswalk removal.

A. Conform with CVC 21950.5 by posting of proposed removal at the crosswalk identified for removal for not less than 30 days from the scheduled date of removal.

B. Provide noticing in multiple languages, languages to be determined through input from the Council District Office, the City Manager's Public Information Office, and Neighborhood Services.

C. Post noticing at transit stops within 500-feet of crosswalk proposed for removal not less than 30 days from the scheduled date of removal.

D. Communicate with Council District Office, the City Manager's Public Information Office, and Neighborhood Services prior to removal to identify appropriate community organizations to provide notice via electronic communications, including but not limited to:

   a. Community and neighborhood associations;

   b. Property business improvement districts; and

   c. Schools.

   Notice to be made not less than 30 days from the scheduled date of crosswalk removal.