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1 INTRODUCTION

This manual was prepared by the City of San Jose Department of Transportation (SJDOT). The manual establishes uniform policies and guidelines to carry out the public street design functions of the City in conjunction with Department of Public Works. It is neither intended as, nor does it establish, a legal standard for these functions. Many of the instructions given herein are subject to amendment as conditions and experience warrant.

The geometric design criteria in these guidelines provide a guide for the engineer to exercise sound judgment in applying standards, consistent with SJDOT policies, in the design of projects. This guidance allows for flexibility in applying design standards and approving design exceptions that take the context of the project location into consideration; which enables the designer to tailor the design, as appropriate, for the specific circumstances while maintaining safety.

The design standards used for any project should equal or exceed the minimum given in these guidelines to the maximum extent feasible, taking into account costs (initial and life-cycle), traffic volumes, traffic and safety benefits, right of way, socio-economic and environmental impacts, maintenance, etc. Because design standards have evolved over many years, many existing city streets do not conform fully to current standards. The current guideline standards are not intended, warranted, nor economically feasible to be applied retroactively to all existing city streets. However, when warranted, upgrading of existing street features such as lighting, median treatment, etc., should be considered, either as independent projects or as part of larger projects. To promote uniform practice on a citywide basis, design features or elements which deviate from the standards indicated herein shall require the approval of Department of Transportation and Department of Public Works. A record of the decision not to upgrade nonstandard features should be documented.

These guidelines do not address roadway signs. Guidance for use of roadway signs can be found in Part 2 – Signs of the 2006 California Manual on Uniform Traffic Control Devices (MUTCD).

The standards in these guidelines generally conform to the standards and policies set forth in the 2006 California MUTCD, 2006/2007 California Highway Design Manual (HDM) (English Version), and American Association of State Highway and Transportation Officials (AASHTO) publication, “A Policy on Geometric Design of Highways and Streets” (2004), and City of San Jose Municipal Code. AASHTO policies and standards do not always satisfy City of San Jose conditions. When standards differ, the instructions in this manual govern.
2 BASIC DESIGN POLICIES

2.1 Design Speed

Design speed is defined as: “a speed selected to establish specific minimum geometric design elements for a particular section of roadway”. These design elements include horizontal alignment, and sight distance. The choice of design speed is influenced principally by the character of terrain, economic considerations, environmental factors, type and anticipated volume of traffic, and functional classification of the roadway. In addition, the selected design speed should be consistent with the speeds that are likely to be expected on a given roadway facility.

Design speed for residential streets should range from 30 mph to 40 mph.

Design speed for collectors and arterials should range from 40 mph to 45mph.

The minimum design speed shall be 25 mph.

Design speed should be 5 to 10 mph greater than the highest of the following:

- Posted speed limit.
- Anticipated speed based on geometric restrictions
- Equal or greater than the 85th percentile of speed determined through a speed survey

Section 3.1 of these guidelines provides minimum standards for curvature and section 3.6.2 provides stopping sight distance requirements.

For facilities with design speeds that exceed 45mph, AASHTO Standards should be followed with prior SJ DOT approval.

Design should assume a roadway cross section that does not include superelevation.

2.2 Design Vehicle

Any vehicle whether car, bus, truck or combination tractor semi-trailer while turning a curve covers a wider path than the width of the vehicle. The front steering axle can generally follow a circular curve, but the following axles (and trailers) will swing inside toward the center of the curve. The swept width is the total path width needed by the vehicle body to traverse a curve and is the preferred performance reference for design of tight curves on narrow streets and tight intersections with obstructions.

The standard design vehicle length is 20 ft, except if buses and trucks are expected to use the facility.

Streets on designated bus routes should be designed to accommodate maneuvering of the Valley Transportation Authority (VTA) bus (except tandem bus). The AASHTO Bus Design Vehicle has a 25-foot wheel base and 40-foot overall length.
If trucks are expected to use the facility, as in the case of collectors and major arterials, the design vehicle should be the largest truck expected to use the facility. The California Legal Design Vehicle has a 65-foot overall length with 20-foot tractor wheel base and 38-foot trailer wheel base.

Refer to City of San Jose Municipal Code (SJMC) Chapter 11.96 for restrictions on the use of designated City streets by trucks exceeding 5 tons, or in some areas, 7 tons. Information on streets that are currently restricted can be found on the City of San Jose website by accessing the Municipal Code link on the following web address:


This ordinance also provides exemptions to businesses that are located on-street and require using the street for business operations.

A roadway segment should be designed to accommodate maneuvering of the fire truck, which will serve the relevant area.

Consult with the Department of Public Works for project specific requirements.

### 2.3 Pedestrian and Bicycle Safety

All streets should provide for pedestrian safety, convenience and accessibility. Streets with high pedestrian volumes should be evaluated for physical enhancements such as:

- Installation or removal of crosswalks
- Installation of curb ramps at intersections for wheelchair accessibility
- Pavement markings
- Provision of refuge islands and sidewalks

The bicycle design should be used to encourage the use of bicycle safe and friendly street design such as:

- Low speed right turn designs and limit double right turn lanes
- Wide curb lanes
- Discourage five or more lanes per roadway direction

### 2.4 Modifications to Street Standards

Modifications to the City’s street design standards may be considered under special circumstances. Requests for nonstandard design must be based on standard engineering practice and must be in writing. The requests must be prepared by a qualified registered civil engineer and must justify the proposed nonstandard design and shall include:

- Description of nonstandard design
- All relevant data and technical references to support the design
• Documentation of assumptions made and justification
• Description of analysis and methodology
• Documentation of calculations
• Clearly stated conclusions
• Benefits of the nonstandard design
• Signature and stamp of a qualified engineer or other professional as required by state law

The City will consider the information included in the request and determine if the nonstandard design is reasonable and appropriate.
3 DESIGN CRITERIA

3.1 Street Right of Way – Geometric Cross Section

Design requirements are typically associated with street designations. Table 3.1 lists the street designations used in the City and the relevant design criteria. Each street designation has expected functional criteria, including traffic volumes, level of access control, number of lanes, and design speed. For facilities with design speeds that exceed 45mph, AASHTO Standards should be followed with prior SJ DOT approval. Cross sections of each street designation showing right of way and traveled way widths are shown on Figure 1 through 4. All proposed street designs submitted on tentative maps and site plans that include City streets shall comply with these design criteria. Curved Roadways should be designed for a 0% Superelevation.
<table>
<thead>
<tr>
<th>Street Designation</th>
<th>Number of Travel Lanes</th>
<th>ROW Width, (ft)</th>
<th>Minimum Centerline Radius (ft) *</th>
<th>Minimum Design Speed (mph)</th>
<th>Bike Lanes</th>
<th>On-Street Parking</th>
<th>Median Landscape</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrow Residential **</td>
<td>2</td>
<td>48</td>
<td>300</td>
<td>30</td>
<td>No</td>
<td>Yes**</td>
<td>No</td>
</tr>
<tr>
<td>Minor Residential</td>
<td>2</td>
<td>52</td>
<td>300</td>
<td>30</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Minor Residential</td>
<td>2</td>
<td>56</td>
<td>300</td>
<td>30</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Neighborhood Collector</td>
<td>2</td>
<td>60</td>
<td>300</td>
<td>30</td>
<td>Yes OR</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Neighborhood Collector</td>
<td>2</td>
<td>70</td>
<td>667</td>
<td>40</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Major Collector (4-lanes undivided)</td>
<td>4</td>
<td>90</td>
<td>900</td>
<td>45</td>
<td>Yes AND OR</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Minor Arterial</td>
<td>4</td>
<td>106</td>
<td>900</td>
<td>45</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Major Arterial</td>
<td>6</td>
<td>130</td>
<td>900</td>
<td>45</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* Source: AASHTO Exhibit 3-16 Minimum Radii for Low-Speed Urban Streets for e=0%
** Must be coordinated with Fire Department prior to approval
* UP TO 20 SINGLE FAMILY DETACHED UNITS OR LESS THAN 415' LONG WHICHEVER IS LESS PER RESIDENTIAL DESIGN GUIDELINES
* ON-STREET PARKING AND DRIVEWAY LOCATION MUST BE STAGGERED TO PROVIDE MINIMUM TRAVEL LANE WIDTH OF 20'
* REQUIRES FIRE DEPT. APPROVAL

NARROW RESIDENTIAL STREET
(48' ROW)

* DETACHED SIDEWALK
* UP TO 120 SINGLE FAMILY DETACHED UNITS

MINOR RESIDENTIAL STREET
(52' ROW)
MINOR RESIDENTIAL STREET
(56' ROW)

NEIGHBORHOOD COLLECTOR STREET
(60' ROW)
COLLECTOR STREET
(70' ROW)

MAJOR COLLECTOR - 4 LAKES UNDIVIDED
(90' ROW)

STREET CROSS SECTIONS
70' AND 90' ROW
MINOR ARTERIAL
(106' ROW)

MAJOR ARTERIAL
(130' ROW)
3.2 Lane Widths

The following guidelines for minimum lane widths are to be used on all City projects. Dimensions that vary from these guidelines should only be used under extenuating circumstances and must be approved by authorized Department of Transportation.

<table>
<thead>
<tr>
<th>Type of Lane</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Interior Lane</em></td>
<td></td>
</tr>
<tr>
<td>Next to centerline</td>
<td>11 ft</td>
</tr>
<tr>
<td>Next to curb median</td>
<td>13 ft</td>
</tr>
<tr>
<td>Next to painted median</td>
<td>11 ft</td>
</tr>
<tr>
<td>One Lane next to median without parking</td>
<td>20 ft</td>
</tr>
<tr>
<td>One Lane next to median with parking</td>
<td>26 ft</td>
</tr>
<tr>
<td><em>Curb Lane</em></td>
<td></td>
</tr>
<tr>
<td>No parking w/ bike accommodation</td>
<td>16 ft</td>
</tr>
<tr>
<td>No parking w/out bike accommodation</td>
<td>14 ft</td>
</tr>
<tr>
<td>Part-time parking*</td>
<td>12 ft</td>
</tr>
<tr>
<td>With parking – Residential</td>
<td>17 ft</td>
</tr>
<tr>
<td>With parking – Collector</td>
<td>20 ft</td>
</tr>
<tr>
<td><em>Turn Lane</em></td>
<td></td>
</tr>
<tr>
<td>Left turn</td>
<td>10 ft</td>
</tr>
<tr>
<td>2-way left turn</td>
<td>12 ft-16ft</td>
</tr>
<tr>
<td>Left turn (next to median island)</td>
<td>11 ft</td>
</tr>
<tr>
<td>Double left turn lanes</td>
<td>10 ft</td>
</tr>
<tr>
<td>Right Turn</td>
<td>12 ft</td>
</tr>
<tr>
<td><em>Bike Lane (Next to 11' travel lane minimum)</em></td>
<td></td>
</tr>
<tr>
<td>No parking</td>
<td>5 ft - 6 ft</td>
</tr>
<tr>
<td>With parking</td>
<td>5 ft</td>
</tr>
</tbody>
</table>

* Only with prior SJDOT approval
3.2.1 **Left Turn Lanes**

Left turn lanes guide and store turning vehicles out of the through traffic and reduce the likelihood of rear-end accidents. Single solid white 8” stripes with type "G" retro-reflective markers separate the turn lane from the through lane(s) (See Figure 24 – Detail 10)

Refer to Pavement Transition Section 3.3 in this manual for minimum taper and stacking lengths.
3.2.2 Two-Way Left Turn Lanes
Two-Way left turn lanes (Figure 5) may be used on roadways where there is a multitude of left turning vehicles with no concentration at any specific location, in conjunction with bike lanes to restrict lane width, or at an interim installation until construction of a planned median island becomes practical. The minimum width for these lanes is 12' but may be up to 16' if unusual street widths are encountered. Striping for two-way left turn lanes consists of solid yellow 4" stripes on the outside in each direction with a 4" broken yellow inside stripe. Spacing for inside stripe is 12' paint and 36' blank space. One type "D" reflective marker is installed every 24' outside the outer stripe and every 96' in line with the interior stripe (See Figure 23 -Detail 8).
3.2.3 Right Turn Lanes
Right turn only lanes may be used at locations when free movement for turning vehicles is desired and existing lane width permits impairment of such free movement. Minimum width for right turn lanes is 12 feet. These lanes may also be used to shadow vehicles entering roadway from side streets at unimproved locations or areas of restricted visibility. Right turn lanes are delineated by a solid 8" white stripe with type "G" raised retro-reflective markers and pavement marking arrows (See Figure 24 – Detail 10).

3.2.4 Trap Lanes
Lane drop marking (Figure 6) consisting of an 8-inch wide single solid white line preceded by an 8-inch wide, white broken line, 3 feet painted length with a 12 feet gap separation (See Figure 23 Detail 9), should be placed in advance of an intersection where a through lane becomes a "trap lane" (that is, a turn only lane) to provide additional notice to road users in that lane. Engineering judgment in conjunction with Table 3.7 – DSD is used to determine how far in advance of the mandatory turn to begin the lane drop marking.
TYPICAL TRAP LANE CONFIGURATIONS

TRAP LANE - LEFT TURN

TRAP LANE - RIGHT TURN

STRIPING DETAIL 6

STRIPING DETAIL 9 (SEE SECTION 3.2.4)
3.2.5 Bike Lanes

Installation of bike lanes requires Council approval.

Normal installation, where parking is restricted, is 6-foot from face of curb using a single solid white 6-inch stripe (See Figure 7). Normal installation, with parking, is 8-foot from face of curb with a single solid white 4-inch stripe and 14-foot from face of curb with a single solid white 6-inch stripe. Minimum bike lane width with curbing is 5-foot and, where no gutter is present, 4-foot may be used as a minimum. Bike lane symbol should be placed at 20-foot beyond curb return. The final 200-foot from end of return shall be detail 12 broken white. For blocks less than 300’ in length, final 100’ should be detail broken white. City standard bike lane symbol and arrow shall be installed at beginning of all intersection breaks and at far side of all T-intersections and installed at ¼ mile intervals.

Pavement reflectors shall not be placed adjacent to bike lane striping.
TYPICAL BIKE LANE CONFIGURATION

100' IF BLOCK IS LESS THAN 300' LONG

200'

20'
BIKE LANE TREATMENT AT RIGHT TURN ONLY LANE
RIGHT LANE BECOMES RIGHT-TURN-ONLY LANE
3.3 **Pavement Transitions**

3.3.1 **Turn Lane Taper and Stacking Length**

A turn lane consists of an approach transition length, taper length and stacking length as shown in Figure 8. For a left-turn lane, the taper consists of a reversing curve to direct traffic into the turn lane. The stacking length provides storage for queuing vehicles at the intersection and is based on a traffic analysis. The taper and stacking lengths should provide sufficient deceleration distance for vehicles based on the design speed of the roadway. The approach transition length (L) from centerline to beginning of taper is based on the following formula:

(i) For speeds $\geq 45$ mph

$$L = \text{Horizontal distance (ft)} \times (\text{Posted, Design Speed for New Construction, Statutory Speed, or 85th percentile speed (mph)})$$

(ii) For speeds $< 40$ mph

$$L = \text{Horizontal distance (ft)} \times (\text{Posted, Design Speed for New Construction, Statutory Speed, or 85th percentile speed (mph)})^2 / 60.$$  

Standard taper lengths are 60, 90 and 120 feet. 60-foot tapers should not be normally used, except where it is based on engineering judgment. 120-foot tapers shall be used for double left turn lanes.

The minimum stacking length should be 65 feet. If truck traffic exceeds 10 percent of peak hour traffic, the minimum stacking length should be 90 feet (i.e. to accommodate 20-foot car and 65-foot truck).

The approach transition (L) may also be used as the taper for a right turn lane.

Guidelines for minimum taper and stacking lengths, based on desirable deceleration distances, are shown in Table 3.3

---

1 (See MUTCD CA Supplement)
Table 3.3: Minimum Combinations for Taper/Stacking Distance

<table>
<thead>
<tr>
<th>Speed Limit (mph)</th>
<th>60</th>
<th>90</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>70</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>30</td>
<td>90</td>
<td>70</td>
<td>-</td>
</tr>
<tr>
<td>35</td>
<td>110</td>
<td>90</td>
<td>-</td>
</tr>
<tr>
<td>40</td>
<td>-</td>
<td>130</td>
<td>120</td>
</tr>
<tr>
<td>45</td>
<td>-</td>
<td>170</td>
<td>160</td>
</tr>
<tr>
<td>50</td>
<td>-</td>
<td>230</td>
<td>220</td>
</tr>
<tr>
<td>55</td>
<td>-</td>
<td>290</td>
<td>280</td>
</tr>
</tbody>
</table>
NOTES:
1. FOR CALCULATION OF L, REFER TO SECTION 3.3.2
2. REFER TO SECTION 3.3.1 FOR APPROACH TRANSITION, TAPER, AND STACKING LENGTH GUIDELINES

85TH PERCENTILE SPEED (mph) | d (ft)
--- | ---
30 | 490
45 | 720

Reference: MUTCD Table 2C-4

STANDARD LEFT TURN CHANNELIZATION

LANE REDUCTION AND TURN LANE
3.3.2 Lane Reduction (Roadway Narrowing)
At any location where lane widths are being reduced (see Figure 8), the minimum length \( L_{\text{min}} \) over which to accomplish the transition should be equal to:

\[
L_{\text{min}} = \text{Horizontal distance} \times 85^{\text{th}} \text{ percentile speed} \quad \text{for speeds} \geq 45 \text{ mph}
\]

\[
L_{\text{min}} = \text{Horizontal distance} \times (85^{\text{th}} \text{ percentile speed})^{2}/60 \quad \text{for speeds} < 40 \text{ mph}
\]

3.3.3 Acceleration/Deceleration Lanes
If the traveled way width can accommodate it, speed change lanes (acceleration and deceleration lanes) shall be provided at approach intersections. Speed change lanes could be in taper or parallel form. Table 3.4 provides length of acceleration and deceleration lanes for various speeds for two cases: Stop condition, and vehicle turning at 15mph.

Table 3.4: Length of Acceleration and Deceleration Lanes (ft)*

<table>
<thead>
<tr>
<th>Design Speed</th>
<th>Stop Condition</th>
<th>15 mph Turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>mph</td>
<td>Acceleration</td>
<td>Deceleration</td>
</tr>
<tr>
<td>25</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td>30</td>
<td>180</td>
<td>235</td>
</tr>
<tr>
<td>35</td>
<td>280</td>
<td>280</td>
</tr>
<tr>
<td>40</td>
<td>360</td>
<td>320</td>
</tr>
<tr>
<td>45</td>
<td>560</td>
<td>385</td>
</tr>
<tr>
<td>50</td>
<td>720</td>
<td>435</td>
</tr>
<tr>
<td>55</td>
<td>960</td>
<td>480</td>
</tr>
</tbody>
</table>

*Source: AASHTO 2004 Exhibits 10-70 and 10-73 design (except acceleration decelerations lanes for 25mph design speed)

3.4 Median Standards
3.4.1 Median and Corner (Porkchop) Islands
An island is a defined area between traffic lanes for control of vehicular movements or for pedestrian refuge. An island may be designated by paint, chatter bars, pavement markers, curbs or other devices.

Painted corner islands are formed with single solid white 8" stripes.

The design of islands must be approved by the Department of Transportation and Department of Public Works. Islands formed by curbing only normally should not be installed permanently. If an interim physical island is necessary it shall be one foot to 14 feet wide.
Double solid yellow 4” stripes shall be used to designate the edge of a median where the median area is an all-paved, at-grade section of the roadway.

The island formed by double yellow stripes shall be at least 2' between the double lines.

Type K object markers or a vertical marker approved by the City shall be used on the noses of median islands. Exceptions include locations where keep right signs are installed.
3.4.2 Median Openings

Openings in median islands should normally be provided at approximately 1320 feet intervals if full movements are allowed and posted speed is ≤45 mph. This distance could be reduced to 660 ft if only directional movement is allowed. Directional Median Opening means an opening in a restrictive median which provides for U-turn only, and/or left-turn in movements. Directional median openings for two opposing left or "U-turn" movements along one segment of road are considered one directional median opening.

Factors that should be considered in the location of openings include the location of driveways, the volume of turning movements, the proximity of traffic signals, visibility, accident experience, delays and other related matters. Openings should normally not be provided within 600 feet of a major intersection. An exception to this guideline is a location where U-turn traffic at a major intersection results in a significant adverse impact on the efficient operation of the intersection. In this case, banning U-turn may be considered. When a median opening falls within 300 ft of an access opening such as a driveway, it should be placed across the access opening.

Median openings are provided when traffic traveling in opposing directions is separated by a barrier median. Typically, median openings are provided at all signalized at-grade intersections, and at unsignalized junctions of arterial and collector streets. They may be provided at driveways only where they will have minimum impact on roadway flow.

Minimum desired spacing of unsignalized median openings at driveways as functions of speed are given in Table 3.5. This spacing best applies to retrofit situations. Median openings for left-turn entrances (where there is no left-turn exit from the activity center) should be spaced to allow sufficient storage for left-turning vehicles.

<table>
<thead>
<tr>
<th>Speed Limit (mph)</th>
<th>Minimum Spacing (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>370</td>
</tr>
<tr>
<td>35</td>
<td>460</td>
</tr>
<tr>
<td>40</td>
<td>530</td>
</tr>
<tr>
<td>45</td>
<td>660</td>
</tr>
<tr>
<td>50</td>
<td>780</td>
</tr>
<tr>
<td>55</td>
<td>910</td>
</tr>
</tbody>
</table>

(Source): NCHRP report 348 Access Management Guidelines for Activity Centers

Ideally spacing of median openings should be conducive to signalization. This spacing should reflect traffic signal coordination requirements, storage space needed for left turns, bay tapers, and roadway aesthetic and landscaping goals.
Median openings at driveways can be subject to closure where volumes warrant signals, but signal spacing would be inappropriate. Median openings should be set far enough back from nearby intersections to avoid possible interference with intersection queues.

Usually a median opening of 60 feet is adequate for 90° intersections with median widths of 22 feet or greater. When the median width is less than 22 feet, a median opening of 70 feet is needed. However, the length of median opening should be established by using truck turn templates.

Median opening design elements include the median width, the spacing of median openings, and the geometrics of median noses at openings. The design of the median nose can vary from semicircular, usually for medians in the 4-foot to 10-foot range, to bullet nose design, for wider medians and for intersections that will accommodate semi-trailer trucks.

The bullet nose is formed by a 60’ control radius arc that terminates by a median nose radius that is normally one-fifth the width of the median (e.g., a bullet nose design for a median opening in a 20-foot-wide median would have a small nose radius of 4-feet that could connect a 60-foot radius with a tangent).
**Figure 10** shows a typical bullet nose detail.

The large radii should closely fit the path of the inner rear wheel of the selected design vehicle. The advantages are that the driver of the left-turning vehicle, especially a truck, has a better guide for the maneuver. The median opening can be kept to a minimum, and vehicle encroachment is minimized.

On six lanes major arterials, only right-in, right-out access is allowed on six lanes major arterials. No full access median opening is allowed.
STACKING LENGTH
REFER TO SECTION 3.3.1

10'

90'

REVERSE CURVE

SEE DETAIL

12'
11'
10'
9'
8'
7'
6'
5'
4'
3'
2'
1'

R = 30'

25'

10'

BC

40'

EXTENSION OF Q

DETAIL

TYPICAL MEDIAN OPENING CONFIGURATION
3.4.3 Horizontal Clearance
The horizontal clearance is measured from the edge of the traveled way to the nearest point on a roadside obstruction (usually the bottom) such as utility pole or bridge piers. Horizontal clearances to all roadside objects should be based on engineering judgment with the objective of maximizing the distance between roadside objects and the edge of traveled way.

On city streets with curbs, placement of roadside objects including barriers, piers, sign and signal supports, mature trees, landscaping items, and power poles should be placed at a minimum horizontal clearance of 1 foot 6 inches(*) per Caltrans requirements.

On curbed roadway sections, a minimum clearance of 3 feet (**) should be provided along the curb returns of intersections and near the edges of driveways to allow for design vehicle off-tracking. On streets where no curb is provided, minimum horizontal clearance is 4 feet (**).

Where sidewalks are located immediately adjacent to curbs, fixed objects should be located beyond the back of sidewalk to provide an unobstructed area for pedestrians that satisfies ADA requirements.

(*) AASHTO pp. 318-319
(**) CA HDM 309.1

3.5 Curb Knuckles, Cul-De-Sacs, and Alleys

3.5.1 Curb Knuckles
When a 90 degrees curvature in the street alignment is proposed, a curb knuckle should be provided. Curb knuckles should meet the requirement shown in Figure 12.
CURB KNUCKLE
(52' ROW)

CURB KNUCKLE
(48' ROW)
3.5.2 Cul-De-Sacs

Permanent dead-end streets will be designed with an adequate cul-de-sac at the terminus, except for dead-end streets less than one hundred fifty (150) feet in length, if municipal services such as fire, refuse, and postal service, can be provided without the use of the street.

Dead-end streets may exceed four hundred fifteen (415) feet in length, as measured from the centerline of the connecting street to the far end of the turnaround area, under the following conditions:

i) The ADT is less than four hundred (400), and

ii) The total length of the dead-end street is not to exceed twelve hundred (1,200) feet in length, and

iii) The street is approved by both the Fire Department and the Department of Public Works, and

iv) The portion of the dead-end street nearest the connecting street has a minimum of thirty-four (34) feet of pavement (measured between faces of curbs) for a distance equal to the total length of the dead-end street less four hundred fifteen (415) feet.

Cul-de-sacs are preferred by the City of San Jose for local street turnarounds. “T” and “Y” shaped turnarounds are not allowed unless otherwise indicated by City Engineer.

The minimum roadway radius for Cul-de-Sacs is thirty (30) feet.

Parking is permitted along curb of a cul-de-sac utilizing a pavement turnaround radius of thirty (30) feet.

Typical Symmetric and Offset Cul-de-Sacs layout are shown in Figure 13.

Use a 48’ ROW typical street section for dead-end streets longer than 150’ but under 415’.
SYMMETRICAL (48' ROW)

OFFSET (48' ROW)

<table>
<thead>
<tr>
<th>STREET TYPE</th>
<th>R/W</th>
<th>FACE OF CURB</th>
<th>SIDEWALK WIDTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESIDENTIAL</td>
<td>48'</td>
<td>30'</td>
<td>9'</td>
</tr>
<tr>
<td>COMMERCIAL</td>
<td>60'</td>
<td>40'</td>
<td>10'</td>
</tr>
</tbody>
</table>
3.5.3 Existing Alleys
Alleys provide access to the side or rear of individual land parcels. They range in width from 16 to 20 feet. It is desirable that both ends of an alley are connected to streets or other alleys. Dead-end alleys should include a turning area as detailed in the cul-de-sac section of this manual. Standard curb return requirements apply for intersection of alleys with other alleys or other streets.

3.6 Intersections

3.6.1 Angle of Intersection
Centerlines of intersecting streets shall have an angle of intersection as close to ninety (90) degrees as is practicable. Local streets shall intersect at an angle no less than sixty (60) degrees.

Arterial and collector streets will have an angle of intersection no less than seventy-five (75) degrees (See Figure 14)
3.6.2 Sight Distance
Providing proper sight distance can greatly reduce the possibility of vehicular conflicts at an intersection.

**Stopping Sight Distance (SSD)** should be provided continuously along a roadway or street including intersection approaches with other major or minor streets.

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Stopping Sight Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>20</td>
<td>125</td>
</tr>
<tr>
<td>25</td>
<td>150</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
</tr>
<tr>
<td>40</td>
<td>300</td>
</tr>
<tr>
<td>45</td>
<td>360</td>
</tr>
<tr>
<td>50</td>
<td>430</td>
</tr>
<tr>
<td>55</td>
<td>500</td>
</tr>
</tbody>
</table>

* Source: Highway Design Manuel Table 201.7

**Decision Sight Distance (DSD)**, at certain locations, sight distance greater than stopping sight distance is desirable to allow drivers time for decisions without making last minute erratic maneuvers.

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Decision Sight Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>225</td>
</tr>
<tr>
<td>20</td>
<td>300</td>
</tr>
<tr>
<td>25</td>
<td>375</td>
</tr>
<tr>
<td>30</td>
<td>450</td>
</tr>
<tr>
<td>35</td>
<td>525</td>
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<td>40</td>
<td>600</td>
</tr>
<tr>
<td>45</td>
<td>675</td>
</tr>
<tr>
<td>50</td>
<td>750</td>
</tr>
<tr>
<td>55</td>
<td>865</td>
</tr>
</tbody>
</table>

* Source: Highway Design Manuel Table 201.7
Intersection Sight Distance (ISD) should also be provided so that drivers of stopped vehicles have sufficient view to allow them to enter or cross the intersecting street. The required sight distance for entering or a crossing vehicle should be at least equal to the stopping sight distance of the intersecting street traffic.

Table 3.8 - ISD provides minimum sight distance requirements for different design speeds for Intersections not controlled by yield, stop signs, or traffic signals, and intersections with stop control on minor road. For the latter, the table provides sight distance for a vehicle making left turn from stop, and a vehicle making right turn from stop or crossing the major street.

Table 3.8 - ISD: Intersection Sight Distance*

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>ISD</th>
<th>No Traffic Control</th>
<th>Stop Controlled</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Left Turn from Stop</td>
<td>Right Turn from Stop or Cross Maneuver</td>
</tr>
<tr>
<td>15</td>
<td>80</td>
<td>170</td>
<td>145</td>
</tr>
<tr>
<td>20</td>
<td>115</td>
<td>225</td>
<td>195</td>
</tr>
<tr>
<td>25</td>
<td>155</td>
<td>280</td>
<td>240</td>
</tr>
<tr>
<td>30</td>
<td>200</td>
<td>335</td>
<td>290</td>
</tr>
<tr>
<td>35</td>
<td>250</td>
<td>390</td>
<td>335</td>
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<tr>
<td>40</td>
<td>305</td>
<td>445</td>
<td>385</td>
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<tr>
<td>45</td>
<td>360</td>
<td>500</td>
<td>430</td>
</tr>
<tr>
<td>50</td>
<td>425</td>
<td>555</td>
<td>480</td>
</tr>
<tr>
<td>55</td>
<td>495</td>
<td>610</td>
<td>530</td>
</tr>
</tbody>
</table>

* Applicable to passenger vehicles turning onto a two-lane road with no median and grades less than 3 percent. Source: AASHTO 2004 Exhibit 9-51, 9-55, and 9-58
INTERSECTION CLEAR ZONE
3.6.3 Curb Returns
The preferred curb radii will depend on the type of vehicles to be accommodated, and the major and crossing street available widths. The Minimum curb return radius shall be based on the vehicles it accommodates. Table 3.9 presents the cross street width occupied by a turning vehicle at a 90 degree intersection for different design vehicles.

Table 3.9: Cross Street Width (d2) for a 90° Intersection

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>d2 for cases A and B where:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R=15 ft</td>
</tr>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>SU</td>
<td>26</td>
</tr>
<tr>
<td>BUS</td>
<td>38</td>
</tr>
<tr>
<td>WB-40</td>
<td>31</td>
</tr>
<tr>
<td>WB-50</td>
<td>42</td>
</tr>
<tr>
<td>WB-62</td>
<td>--</td>
</tr>
<tr>
<td>WB-67</td>
<td>--</td>
</tr>
</tbody>
</table>

Source: AASHTO 2004 Exhibit 9-31

See Figure 16 for definitions of cases A and B, and distances d1, and d2.

Wheelchair ramps should be provided at all curb returns. Wheelchair ramps shall meet City of San Jose standard plans and ADA requirements.
* VEHICLE TURNS FROM PROPER LANE AND SWINGS WIDE ON CROSS STREET $d_1=12$ ft, $d_2$ IS VARIABLE

CASE A

* TURNING VEHICLE SWINGS EQUALLY WIDE ON BOTH STREETS $d_1=d_2$ BOTH VARIABLE

CASE B

SEE TABLE 3.9 FOR FACE OF CURB RADIUS
3.6.4 Driveways
Design requirements for driveway locations onto arterial and collector roadways in all new development are as follows:

i) Entrance and exit drives crossing arterials and collectors are limited to two per three hundred feet of frontage along any major roadway. The nearest pavement edges spaced at least 80’ apart.

ii) A minimum of 150’, measured at curbline, shall separate the nearest pavement edge of any entrance or exit driveway and the curb line to any signalized intersection with arterial and collector roadways.

iii) All new development should promote cross access agreements to limit the number of driveways crossing arterial and collector roadways.

See curb returns section for driveway curb radii requirements.

The driveway entry width is the approximate width needed at the driveway throat to accommodate the swept path of the turning design vehicle. The entry width will differ from the driveway’s overall width, depending on how the driveway is expected to operate. Driveway entries should be placed outside of erosion control, treated slopes, access control or restricted utility easements. The driveway overall width shall meet the requirements of Table 3.10

### Table 3.10: Typical Driveway Entry Widths

<table>
<thead>
<tr>
<th>Driveway width</th>
<th>One-way Ingress/Egress Only</th>
<th>Residential (Single Family)</th>
<th>Residential (Multi-Family)</th>
<th>Business/Industrial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driveway width</td>
<td>16’</td>
<td>16’</td>
<td>26’</td>
<td>32’</td>
</tr>
</tbody>
</table>

3.6.5 Crosswalks
Refer to Crosswalk Installation guidelines shown in Figure 17 to 18. Installation of crosswalks at uncontrolled intersections must be reviewed and approved by the Department of Transportation.

3.7 Diagonal Parking
Figure 20 provides guidelines for diagonal parking installation.
15'-20'
SPLIT PAVEMENT TO ESTABLISH
LOCATION OF CENTERLINE

NOTE:
1. STOP INSTALLATION SHALL ADHERE TO STOP
   SIGN INSTALLATION POLICY

STOP INSTALLATION GUIDELINES -1
1-WAY STOP

2-WAY STOP

3-WAY STOP

4-WAY STOP
NOTES:

1. ADVANCE SCHOOL MESSAGES ARE NOT INSTALLED AT STOPS OR SIGNALS

2. LIMIT LINE SETBACK SHOULD BE 10' IF THE POSTED SPEED IS .25 MPH AND/OR AN ADULT CROSSING GUARD IS PRESENT. OTHERWISE SETBACK SHOULD BE 5'

STOP CONTROLLED INTERSECTION

NO PORTION OF THE CROSSWALK IS TO BE LOCATED IN DRIVEWAY

LEGENDS SHALL BE CENTERED AND STRAIGHT

STOP CONTROLLED INTERSECTION
NOTES:
1. MINIMUM CURB TO CURB STREET WIDTH SHOULD BE 50' FOR DIAGONAL PARKING ON ONE SIDE AND PARALLEL PARKING ON THE OTHER SIDE.
2. MINIMUM CURB TO CURB STREET WIDTH SHOULD BE 46' FOR DIAGONAL PARKING ON ONE SIDE AND NO PARKING ON THE OTHER SIDE.
3. 45° ANGLES SPACES (MAX.)
4. A MINIMUM 60' SETBACK (RED CURB) MUST BE PROVIDED AT ALL INTERSECTIONS
5. A MINIMUM OF 10' OF RED CURB MUST BE INSTALLED FOR ALL APPROACHES TO ALL DRIVEWAYS AND A MINIMUM OF 25' OF RED CURB MUST BE INSTALLED FOR THE FAR SIDE OF ALL DRIVEWAYS.
4 PAVEMENT MARKINGS AND DELINEATION

4.1 Legal Authority
The following sections from the California Vehicle Code pertain to markings:

<table>
<thead>
<tr>
<th>Section No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>275</td>
<td>Crosswalk</td>
</tr>
<tr>
<td>377</td>
<td>Limit line</td>
</tr>
<tr>
<td>21106a</td>
<td>Establishing of crosswalks</td>
</tr>
<tr>
<td>21374</td>
<td>Directional markings for tourists</td>
</tr>
<tr>
<td>21458</td>
<td>Curb markings</td>
</tr>
<tr>
<td>21459</td>
<td>Distinctive roadway markings</td>
</tr>
<tr>
<td>21460</td>
<td>Double lines</td>
</tr>
<tr>
<td>21460.5</td>
<td>Two-Way left turn lane</td>
</tr>
<tr>
<td>21651</td>
<td>Divided highways</td>
</tr>
<tr>
<td>21657</td>
<td>Designated traffic direction</td>
</tr>
<tr>
<td>21751</td>
<td>Passing without sufficient clearance</td>
</tr>
<tr>
<td>21752</td>
<td>When driving on left prohibited</td>
</tr>
</tbody>
</table>

4.2 General Information

4.2.1 Functions
Markings have definite and important functions to perform in a proper scheme of traffic control. In some instances they are used to supplement the regulations or warnings of other devices such as signs or signals. In other instances they are used alone to produce results not obtained by the use of any other device.

4.2.2 Standardization
Standard markings shall be used only to convey the meaning prescribed in Part 3 – Markings, of the California Manual of Uniform Traffic Control Devices. Markings, no longer applicable, which may create confusion in the mind of the motorist, shall be removed or obliterated as soon as practicable.

4.2.3 Materials
The most common method of applying pavement marking is by use of paint, however, a wide variety of other suitable marking materials is available.
4.2.4 Color
Pavement markings shall be yellow, white, red, blue or green. Black is permitted where pavement does not provide sufficient contrast. The color of curb markings shall conform to CVC 21458.

4.3 General Principles of Longitudinal Markings and Markers
1. Yellow lines delineate the separation of traffic flows in opposing directions or mark the left edgeline of divided roadways.
2. White lines delineate the separation of traffic flows in the same direction or mark the right edgeline.
3. Broken lines are permissive in character.
4. Solid lines are restrictive in character.
5. Width of line indicates the degree of emphasis.
6. Solid double lines indicate maximum restrictions.
7. All longitudinal pavement markings shall be reflectorized except non-reflective markers.
8. Red pavement markers are used to alert possible wrong-way drivers.

4.4 Types of Longitudinal Lines
1. A single broken white line delineates edge of a traffic lane where traffic is permitted in the same direction on both sides of the line.
2. A single broken yellow line is used to delineate the left edge of a traffic lane where travel on the other side of the line is in the opposite direction (two-lane roadway only).
3. A single solid white line is used to delineate the edge of a traffic lane where travel in the same direction is permitted on both sides of the line, but crossing the line is discouraged. It is also used to mark the right edgeline, turn lanes and bike lanes.
4. A single solid yellow line delineates the left edge of a traffic lane to indicate a restriction against passing on the left or delineates the left edgeline of a divided roadway.
5. A double line consisting of a single broken yellow and a single solid yellow delineates traffic on opposite directions where passing is permitted for vehicles adjacent to the broken line and prohibited to vehicles adjacent to the solid line. It is also used to designate a two-way left turn lane where adjacent traffic may cross this marking as part of a left or U-turn maneuver.
6. A double line consisting of two solid yellow lines delineates traffic moving in opposite directions where overtaking and passing is prohibited in either direction. Crossing this line is permitted only as part of a left or U-
turn maneuver. It may also be used to form a painted median or the left edge of roadway line where additional visibility is desired.

7. A dotted line may be used to delineate the extension of a yellow or white line through an intersection.

4.5 Lane Lines

White lane lines separate lanes of traffic traveling in the same direction. All streets with greater than two lanes should have lane delineation for optimum efficiency. Lane lines consist of 4-inch broken white stripes with 7-foot stripes and 17-foot spaces for those locations with speed limits under 45 mph and 12-foot stripes with 36-foot spaces when speed limits are 45 mph or higher. Lane lines should not be installed on roadways where intermittent unimproved areas would require excessive merging situations.

4.6 Transverse Markings

Transverse markings which include word and symbol messages, limit lines, crosswalks and parking tips shall be white except for yellow markings near schools.

4.7 Centerlines

4.7.1 Types and Uses
A yellow centerline separates traffic traveling in opposite directions. Centerline stripes may be used on undivided streets with two-way traffic and may consist of double yellow, broken yellow, or a combination of broken and solid yellow. Double yellow centerlines shall be used on all streets with four or more lanes when a median or two-way left turn lane is not present and should be used on two lane streets except as indicated below.

Broken yellow centerlines may be used on two lane streets in rural areas and on those residential streets with roadway widths of 36' or less. Combination yellow stripes constitute a one-way barrier and may be used on two-lane streets where passing is restricted in one direction.

4.7.2 Warrants for Installation
Centerlines are mandatory on undivided streets with four or more lanes and optional on undivided streets with two lanes. Centerlines should be used in business districts. Centerlines should be used on residential streets where volume warrants. Centerlines may be used on residential streets where a traffic analysis indicates a safety problem such as elbow turns or winding streets with restricted sight distance.
4.8 Edgelines

Edgelines are used as visual aides to delineate the edge of traveled way in those areas lacking curbing.

Right edge of roadway stripes are single solid 4" white with no reflective markers. Left edge of roadway stripes may be either single solid 4" yellow or double yellow, with type "0" reflective markers.

Normal installation of right edgeline is 1' from edge of pavement, however, if lane width is 15' or more, install stripe 11 feet from center line or nearest lane line. Left edge of roadway stripes are normally installed 1' from edge of pavement or median curb.

4.9 Pavement Markers

4.9.1 Reflective Markers

Raised reflective markers have proven invaluable as a visual aide to night time delineation. To a lesser degree, benefits are derived from sound and rumble effects when vehicles drift over lane or centerline stripes. Raised retro-reflective markers are designated as follows:

Type C    Red - clear
Type D    Two-way yellow
Type G    One-way clear
Type H    One-way yellow

Blue Markers Fire hydrant location

4.9.2 Non-Reflective Markers

Non-reflective raised markers may be used in lieu of painted stripes to designate lane lines or centerlines. In the City of San Jose, the most common usage is for the separation of turning vehicles where double turns are permitted. In unusual situations where there is pronounced misalignment, non-reflective markers may be used through an intersection for visual guidance. These markers, commonly referred to as Bott's Dots, are as follows:

Type - A    Non-reflective white
Type - B    Non-reflective yellow

Table 4.2 matches the City of San Jose Standard Striping Details with the State Standard Striping Details and provides a description for city details that do not have matching state details.
### Table 4.2: Striping Detail Summary Table

<table>
<thead>
<tr>
<th>City of San Jose Striping Detail #</th>
<th>Corresponding California Striping Detail #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
</tr>
<tr>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>4</td>
<td>23</td>
</tr>
<tr>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>6</td>
<td>27b</td>
</tr>
<tr>
<td>7</td>
<td>29</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>37</td>
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<td>10</td>
<td>38</td>
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<td>11</td>
<td>39</td>
</tr>
<tr>
<td>12</td>
<td>39a</td>
</tr>
<tr>
<td>13</td>
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<tr>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>21</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>City of San Jose Striping Detail #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Arrows/ Messages</td>
</tr>
<tr>
<td>15</td>
<td>Chatter bars</td>
</tr>
<tr>
<td>16</td>
<td>AY non-reflective buttons</td>
</tr>
<tr>
<td>17</td>
<td>12” White</td>
</tr>
<tr>
<td>18</td>
<td>12” Yellow</td>
</tr>
<tr>
<td>19</td>
<td>24” White</td>
</tr>
<tr>
<td>22*</td>
<td>27B (modified)</td>
</tr>
</tbody>
</table>

*City of San Jose striping detail 22 matches State striping detail 27B except it substitutes the 4” solid white with a 4” dashed white right edge line consisting of a 4’ paint, 8’ gap pattern.*
DETAIL 1

DETAIL 2

DETAIL 3

LEGEND
MARKERS
○ TYPE A WHITE NON-REFLECTIVE
☒ TYPE AY YELLOW NON-REFLECTIVE
□ TYPE C RED-CLEAR RETROREFLECTIVE
☒ TYPE D TWO-WAY YELLOW RETROREFLECTIVE
□ TYPE G ONE-WAY CLEAR RETROREFLECTIVE
☒ TYPE H ONE-WAY YELLOW RETROREFLECTIVE

LINES
4" WHITE
4" YELLOW
DIRECTION OF TRAVEL

JULY 2008

STRIPIING AND MARKERS DETAILS -1
4.10 Unimproved Roadway Shoulder Areas (Rural Roads)

There are rural areas in the City with 2-lane roadways about 24 feet wide and no curbs.

As these areas are urbanized, standard street improvements are constructed including parking lanes, curbs, gutters and sidewalks. In some cases, additional travel lanes and even median islands are constructed.

For 2-lane rural roads, a centerline (including raised reflectorized pavement markers) and edge of roadway stripes should be installed.

Any improvement, less than ultimate improvement, is interim and should only be undertaken based upon an evaluation of its need, the cost and the projected service life. The cost should include initial construction and on-going maintenance.

The following improvements may be considered:

1. Provide a shoulder, in the widths as provided for in Table 4.3 (based on Table 307.2 of Caltrans Highway Design Manual):

<table>
<thead>
<tr>
<th>Two-Way ADT (vpd)</th>
<th>Minimum Shoulder Width (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 400</td>
<td>2 feet</td>
</tr>
<tr>
<td>Less than 400*</td>
<td>4 feet</td>
</tr>
<tr>
<td>Over 400</td>
<td>8 feet</td>
</tr>
</tbody>
</table>

*When bikes are present

The width is subject to available right-of-way and drainage considerations-The use of bituminous, gravel or natural soil material shall be reviewed by the Departments of Public Works and Transportation.

2. If a shoulder is not feasible, remove non break-away obstructions within the area adjacent to the travel way, as determined in Table 4.3 above. If removal is not practical, then the obstruction should be clearly delineated so that it is visible at night.

3. Install roadside delineators, object markers, warning signs and guardrails based upon an engineering evaluation of their need and benefit.

4.11 Gore Stripes

Gore stripes are single solid white 8" stripes used to guide vehicles around an obstruction in the roadway, i.e., signs, corner islands. Typical location on the left side of obstruction is 11 feet from existing lane or centerline stripe. Typical
right side location is 1' from island face of curb. Solid 8" white stripes are used to form painted islands to shadow or provide protected location for signing. Refer for Figure 9 for typical gore stripes.

4.12 Railroad Markings

All highway-rail grade crossing pavement markings shall be reflectorized white. Typical pavement markings in advance of a highway-rail grade crossing shall consist of an X, the letters RR, solid lane lines (No passing or lane change), and certain transverse lines as shown in Figure 26. For additional details refer to MUTCD California Supplement Part 8.

The stop line should be a transverse line at a right angle to the traveled way at a point where a vehicle is to stop or as near to that point as possible. The stop line should be approximately 8 ft in advance of the gate (if present), but no closer than 15 ft from the nearest rail.

Railroad crossings shall be properly designated with appropriate signage as requested by MUTCD California Supplement.

Refer to MUTCD California Supplement Part 10 for Highway-Light Rail Crossing Markings and Signage.
NOTES:
1. MINIMUM 8 FT FROM THE GATE (IF PRESENT), BUT NO CLOSER THAN 15 FT FROM THE NEAREST RAIL.