

# Adoption of Resolution for Caltrans Highway Design Manual Topic 405: Intersection Design Analysis for Arroyo Vista from Las Mesitas to Ria

AUGUST 14, 2024




# Arroyo Vista from Las Mesitas to Ria





# Reduction of Speeds on Arroyo Vista



City of Rancho Santa Margarita


Engineering and Traffic Survey (E&TS)

Drafted: July 23, 2024

Speed Survey ID: 5

Arroyo Vista

Las Mesitas to Ria

<div>Prevailing Speed Data</div> <div><div>Date of Survey</div><div>4/3/2024</div></div> <div><div>Time of Survey</div><div>11:35 AM</div></div> <div><div>85th Percentile</div><div>42 mph</div></div> <div><div>50th Percentile</div><div>37 mph</div></div> <div><div>10 mph Pace</div><div>31-40 mph</div></div> <div><div>Percent in Pace</div><div>71 %</div></div>	<div>Collision History</div> <div><div>Months Evaluated</div><div>36</div></div> <div><div>Total Collisions</div><div>2</div></div> <div><div>Speed Related</div><div>0</div></div> <div><div>Collisions/Million Vehicle Miles</div><div>0.5</div></div>	<div><div>REGISTERED PROFESSIONAL ENGINEER</div><div>Robert Vu</div><div>No. TR 2890</div><div>TRAFFIC</div><div>STATE OF CALIFORNIA</div></div> <div><div>Recommended</div><div><div>SPEED LIMIT</div><div>40</div><div>Posted</div></div><div><div>SPEED LIMIT</div><div>30</div></div></div>
<div>Traffic Factors</div> <div><div>Average Daily Traffic</div><div>3,400</div></div> <div><div>On-Street Parking</div><div>Yes</div></div> <div><div>Painted Bike Lanes</div><div>No</div></div> <div><div>Crosswalks</div><div>@ Traffic Signals</div></div>	<div>Recommendations</div> <div>85th percentile speed requires a minimum posted speed limit of 40 mph. Per CVC 22358.6 and AB-43, the speed limit may be reduced up to 12.4 MPH below the 85th percentile speed. Reduce posted speed limit to 30 mph.</div>	
<div>Roadway Features</div> <div><div>Segment Length</div><div>1.07 miles</div></div> <div><div>Visibility</div><div>Acceptable</div></div> <div><div>Facility Type</div><div>Local</div></div> <div><div>Lane Configuration</div><div>2 lanes</div></div> <div><div>Right of Way Width</div><div>56 feet</div></div>		
<div>Adjacent Land Uses</div> <div>Residential, open space</div>		
<div>Other</div> <div>Curvilinear roadway with cross street stops.</div>		

Path: Z:\Shared\UcJobs\_15600-16000\_15900\15904\05\_Design\GIS\maps\20240610SpeedSurveyWorkbook.mxd

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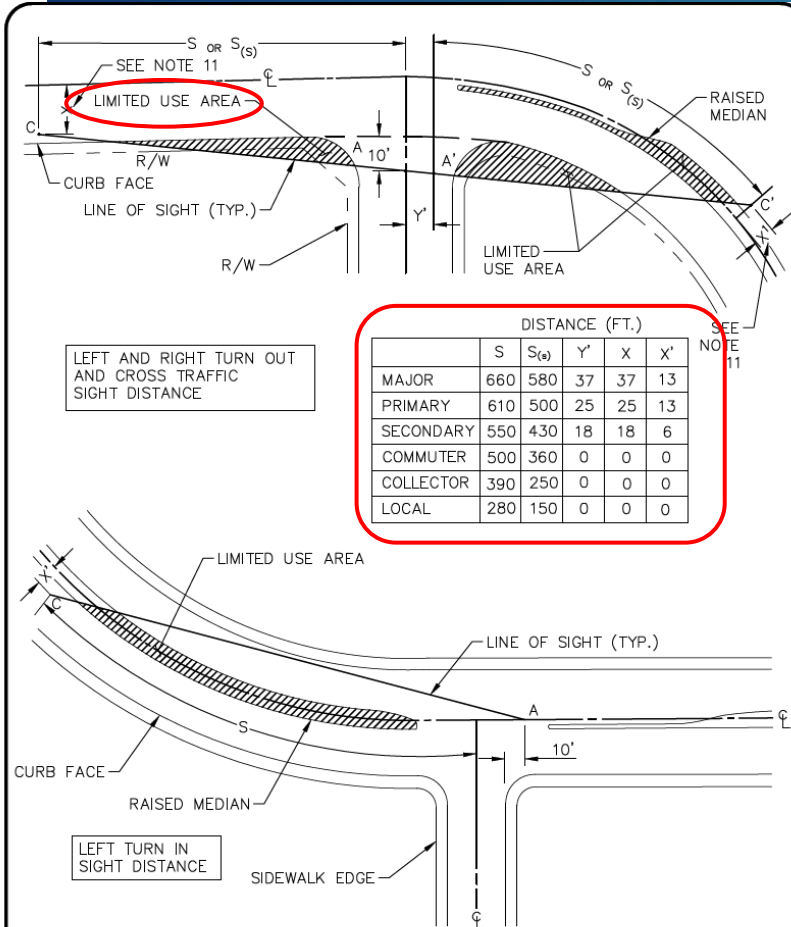
# Intersection of Arroyo Vista & Tollon





# Orange County Standard Plan 1117

## Intersection Site Distance

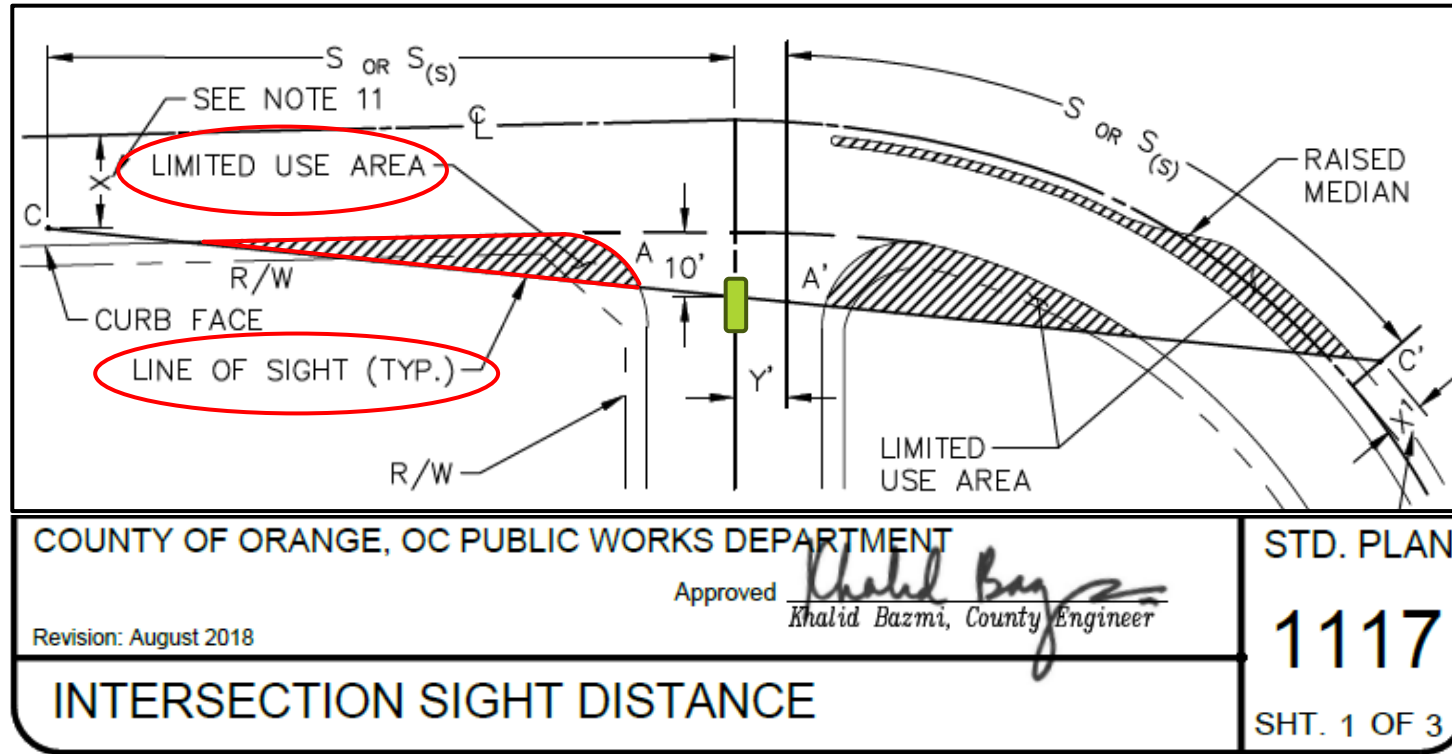


### NOTES:

- THE DISTANCE S REPRESENTS THE INTERSECTION SIGHT DISTANCE MEASURED ALONG THE CENTERLINE OF THE ROAD. THE INTERSECTION SIGHT DISTANCE IS THE DISTANCE REQUIRED TO ALLOW 7½ SECONDS FOR THE DRIVER ON THE CROSS ROAD (OR LEFT TURN POCKET) TO SAFELY CROSS THE MAIN ROADWAY OR TURN LEFT WHILE THE APPROACH VEHICLE TRAVELS AT THE ASSUMED DESIGN SPEED OF THE MAIN ROADWAY.
- THE DISTANCE S SHOULD BE INCREASED BY 20 PERCENT FROM THE AMOUNT SHOWN ON THE TABLE ON SUSTAINED DOWNGRADES STEEPER THAN 3 PERCENT AND LONGER THAN ONE MILE.
- POINTS A AND A' ARE THE LOCATIONS OF A DRIVER'S LINE OF SIGHT (3.5 FOOT EYE HEIGHT) TO ONCOMING VEHICLES (4.25 FOOT OBJECT HEIGHT) LOCATED AT POINTS C AND C' WHILE IN A VEHICLE AT AN INTERSECTION 10 FEET BACK FROM THE PROJECTION OF THE CURB LINE. IN NO CASE SHALL POINTS A OR A' BE LESS THAN FIFTEEN (15) FEET FROM THE EDGE OF THE TRAVELED WAY.
- THE DISTANCE Y' IS THE DISTANCE MEASURED FROM THE CENTERLINE OF THE MAIN ROAD TO THE FAR RIGHT THROUGH TRAVEL LANE. THE DISTANCE Y' IS EQUAL TO ZERO FOR T-INTERSECTIONS. THE DISTANCE X IS THE DISTANCE MEASURED FROM THE CENTERLINE OF THE MAIN ROAD TO THE CENTER OF THE FAR RIGHT THROUGH TRAVEL LANE. THE DISTANCE X' IS THE DISTANCE MEASURED FROM THE CENTERLINE OF THE MAIN ROAD TO THE CENTER OF THE TRAVEL LANE NEAREST THE CENTERLINE OF THE ROAD.
- THE LIMITED USE AREA IS DETERMINED BY THE GRAPHICAL METHOD USING THE APPROPRIATE DISTANCES GIVEN IN THE ABOVE TABLE. IT SHALL BE USED FOR THE PURPOSE OF PROHIBITING OR CLEARING OBSTRUCTIONS IN ORDER TO MAINTAIN ADEQUATE SIGHT DISTANCE AT INTERSECTIONS.
- THE LINE OF SIGHT LINE SHALL BE SHOWN AT INTERSECTIONS ON ALL LANDSCAPING PLANS, GRADING PLANS AND TENTATIVE TRACT PLANS WHERE SAFE SIGHT DISTANCE IS QUESTIONABLE. IN CASES WHERE AN INTERSECTION IS LOCATED ON A VERTICAL CURVE, A PROFILE AT THE LINE OF SIGHT MAY BE REQUIRED.
- OBSTRUCTIONS SUCH AS BUS SHELTERS, WALLS OR LANDSCAPING WITHIN THE LIMITED USE AREA WHICH COULD RESTRICT THE LINE OF SIGHT SHALL NOT BE PERMITTED.
  - PLANTS AND SHRUBS WITHIN THE LIMITED USE AREA SHALL BE OF THE TYPE THAT WILL GROW NO HIGHER THAN 12 INCHES ABOVE THE GROUND AND SHALL BE MAINTAINED AT A MAXIMUM HEIGHT OF 12 INCHES ABOVE THE GROUND. MAINTENANCE AT A LOWER HEIGHT MAY BE REQUIRED ON CREST VERTICAL CURVES PER NOTE 6 ABOVE.
  - A PROFILE OF THE LINE OF SIGHT MAY BE REQUIRED TO VERIFY 12 INCHES MINIMUM VERTICAL CLEARANCE ABOVE VARIABLE HEIGHT OBSTRUCTIONS SUCH AS SLOPE LANDSCAPING, PLANTS AND SHRUBS.

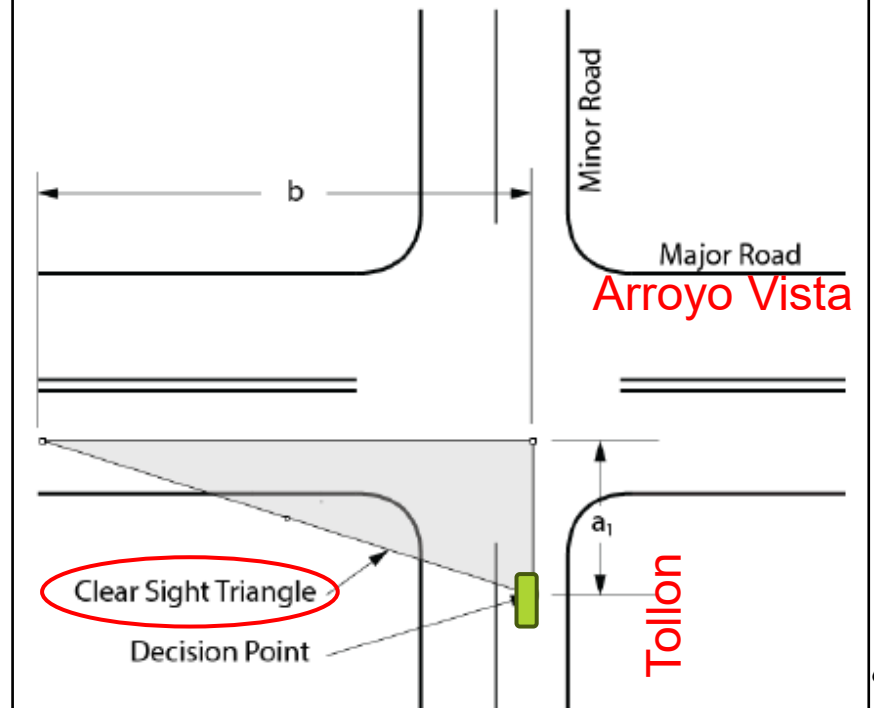
- THE TOE OF SLOPE MAY ENCROACH INTO THE LIMITED USE AREA PROVIDED THAT THE REQUIREMENTS OF (B) ABOVE ARE SATISFIED.
- IN LIEU OF PROVIDING A PROFILE OF THE LINE OF SIGHT, THE TOE OF SLOPE SHALL NOT ENCROACH INTO THE LIMITED USE AREA, AND THE LIMITED USE AREA SHALL SLOPE AT 2 PERCENT MAXIMUM TO THE ROADWAY.
- TREES SHALL NOT BE PERMITTED WITHIN ANY PORTION OF THE LIMITED USE AREA.
- MEDIAN AREAS LESS THAN SIX (6) FEET IN WIDTH SHALL BE PAVED WITH CONCRETE PER STANDARD PLAN 1807, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- RESIDENTIAL DRIVEWAYS SERVING FOUR OR MORE UNITS AND COMMERCIAL DRIVEWAYS SHALL BE TREATED AS A LOCAL STREET INTERSECTION.
- X AND X' ARE BASED UPON A STANDARD 14' MEDIAN FOR MAJOR AND PRIMARY HIGHWAYS USE S VALUES FOR UNSIGNALIZED INTERSECTIONS AND S<sub>(s)</sub> VALUES FOR SIGNALIZED INTERSECTIONS.

# Orange County Standard Plan 1117 vs. Caltrans Highway Design Manual Topic 405



## Caltrans Highway Design Manual

**Figure 405.1**  
**Corner Sight Distance (b)**



# Orange County Standard Plan 1117 vs. Caltrans Highway Design Manual Topic 405

## Topic 405 – Intersection Design Standards

### 405.1 Sight Distance

(1) *Stopping Sight Distance.* See Index 201.1 for minimum stopping sight distance requirements.

(2) **Corner Sight Distance.**

(a) General. At unsignalized intersections a substantially clear line of sight should be maintained between the driver of a vehicle, bicyclist or pedestrian stopped on the minor road and the driver of an approaching vehicle on the major road that has no stop. Line of sight for all users should be included in right of way, in order to preserve sight lines.

See DIB 79 for 2R, 3R, certain storm damage, protective betterment, operational, and safety projects on two-lane and three-lane conventional highways.

Adequate time should be provided for the stopped vehicle on the minor road to either cross all lanes of through traffic, cross the near lanes and turn left, or turn right, without requiring through traffic to radically alter their speed. The visibility required for these maneuvers form a clear sight triangle with the corner sight distance  $b$  and the crossing distance  $a_1$  or  $a_2$  (see Figure 405.1 as an example of corner sight distance at a two-lane, two-way highway). Dimensions  $a_1$  and  $a_2$  are measured from the decision point to the center of the lane. The actual number of lanes will vary on the major and minor roads. There should be no sight obstruction within the clear sight triangle.

### Topic 405 (Design Speed):

The minimum corner sight distance (feet) should be determined by the equation:

$1.47V_m * T_g$ , where  $V_m$  is the design speed (mph) of the major road and  $T_g$  is the time gap(seconds) for the minor road vehicle to enter the major road.

### Orange County Std. Plan 1117

	DISTANCE (FT.)				
	S	S <sub>(s)</sub>	Y'	X	X'
MAJOR	660	580	37	37	13
PRIMARY	610	500	25	25	13
SECONDARY	550	430	18	18	6
COMMUTER	500	360	0	0	0
COLLECTOR	390	250	0	0	0
LOCAL	280	150	0	0	0



# Arroyo Vista from Las Mesitas to Ria





# City of RSM Municipal Code

## Title 11 – Streets and Sidewalks

- ▶ Sec. 11.01.020. - Adoption of plans, specifications and regulations
- ▶ RSM Municipal Code Section 11.01.020 states that the City Engineer shall, from time to time, submit to the City Council for approval standard plans and specifications for the construction, improvement and maintenance of roadways within the City, and for the use of such facilities.
- ▶ Upon approval and adoption by resolution, said standard plans and specifications, shall be enforced by the City Engineer and the Director of Planning.



# Recommendations

- ▶ Adoption of Resolution adopting Caltrans Highway Design Manual Topic 405 – Intersection Design Standards for the Roadway Segment of Arroyo Vista From Las Mesitas to Ria