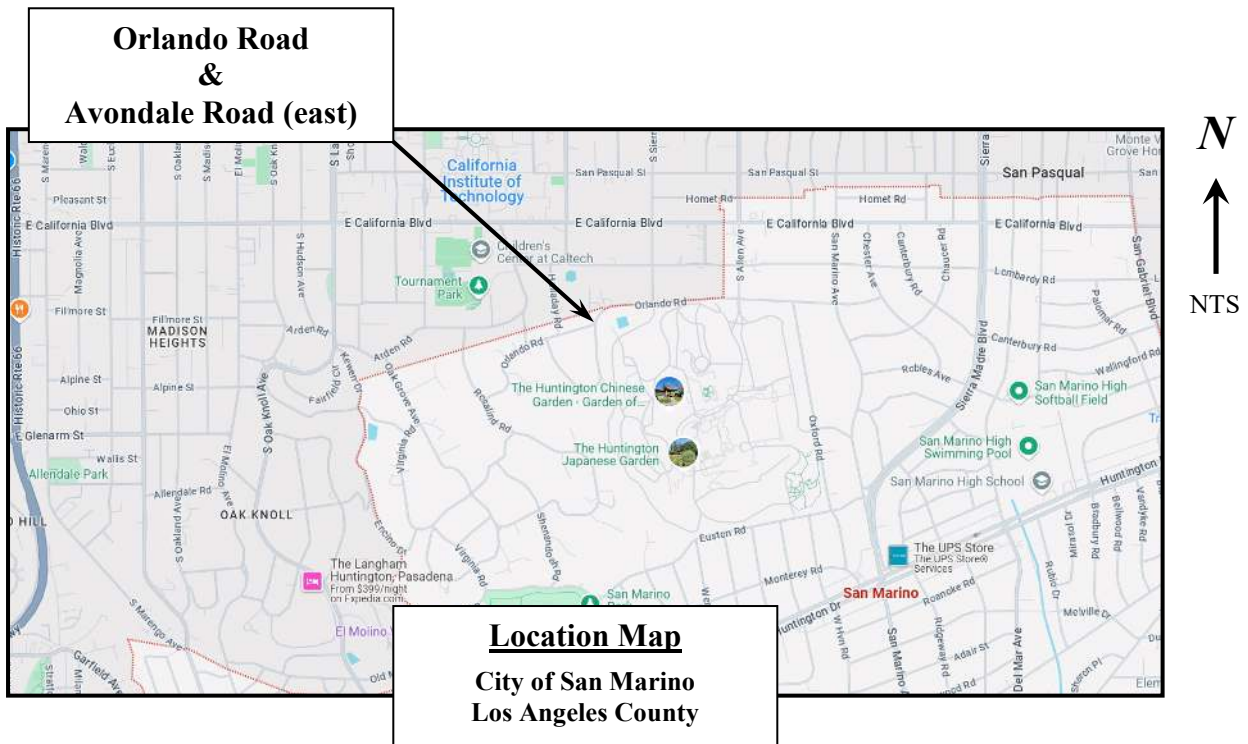

MULTIWAY STOP CONTROL WARRANTS ANALYSIS

INTERSECTION OF ORLANDO ROAD AND AVONDALE ROAD IN THE CITY OF SAN MARINO, CA FEBRUARY 27, 2025

INTRODUCTION

The City of San Marino requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis at the intersection of Orlando Road and Avondale Road (east). This analysis was completed in order to verify if a three-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a non-typical T-intersection with Orlando Road running diagonally in the east-west directions and Avondale Road (east) running in the north-south directions. The intersection is located south of California Boulevard and west of Sierra Madre Boulevard (*see Location Map below*). The intersection is located in the northerly area of the City entirely within the City of San Marino jurisdiction. At the present time, there are no stop controls at the intersection of Orlando Road and Avondale Road (east).



BACKGROUND

Orlando Road is considered an east-west collector roadway with primarily single-family residential properties on both sides of the street. It is noted, the Huntington Library is located on the south-side of Orlando Road, just east of Avondale Road (east). At the intersection with Avondale Road (east), the roadway is approximately 48 feet wide curb-to-curb west of Avondale Road (east), and 40 feet wide curb-to-curb east of Avondale Road (east). The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Orlando Road at or near the intersection. The roadway does have curb, gutter, and sidewalk improvements on the both sides; however, there are no sidewalk improvements on the south-side, east of Avondale Road. Orlando Road has a posted speed limit of 30 MPH. On-street parking is allowed on both sides of the street. Currently, there are no STOP signs on Orlando Road (i.e., uncontrolled) at its intersection with Avondale Road (east).

See Exhibit 1 (next page) for photo images of Orlando Road.

Avondale Road (east) is a considered a north-south local roadway with single-family residential properties along the west-side of the street, and the Huntington Library property along the east-side. At the T-intersection with Orlando Road, which is the northerly terminus of Avondale Road (east), the roadway is approximately 40 feet wide curb-to-curb. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Avondale Road (east) at or near the intersection. The roadway does have curb and gutter improvements on both sides; however, only the west-side includes sidewalk improvements. Avondale Road (east) does not have a posted speed limit; however, the ‘residential’ nature of this street results in a local ‘prima facie’ speed limit of 25 MPH and does not require posting. Currently there is no STOP sign on Avondale Road (east) (i.e., uncontrolled) at its intersection with Orlando Road.

See Exhibit 2 (following page) for a photo image of Avondale Road (east).

EXHIBIT 1



ORLANDO ROAD (*Looking Eastbound*) at AVONDALE ROAD (east)



ORLANDO ROAD (*Looking Westbound*) at AVONDALE ROAD (east)

EXHIBIT 2



AVONDALE ROAD (east) (*Looking Northbound*) at ORLANDO ROAD

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of San Marino follows State guidelines for determining if traffic control devices, such as multi-way stop signs, should be installed. Therefore, the prevailing source used for this analysis is the State of California Manual on Uniform Traffic Control Devices (*California MUTCD*). The California MUTCD contains minimum guidelines regarding traffic volumes, collisions, speeds, visibility, and other criteria in order to satisfy the requirements, in this case, for the recommendation and installation of a multi-way (3-way) stop.

The California MUTCD **Multi-way Stop** Applications Guidance criteria are described in the following four main parts:

- 1) As an interim measure where traffic control signals are justified;
- 2) Reported crashes – five or more in a 12-month period that are susceptible to correction by a multi-way stop installation;
- 3) Minimum traffic and pedestrian volumes, speeds, and delay; and,
- 4) Where a combination of the above criteria are all satisfied to 80 percent.

If any one, or a combination, of these criteria is met, then a multi-way stop application should be considered. If these criteria are not met, the installation of an unwarranted multi-way stop sign installation is typically not recommended.

The California MUTCD guidelines describing Right-of-Way at Intersections, STOP Sign Applications, Multi-way Stop Applications, and Yield Sign Applications are included in Appendix A.

MULTIWAY STOP ANALYSIS

The California MUTCD **Multi-Way Stop Applications** section contains guidelines, such as minimum collisions and traffic volumes necessary for the justification of multi-way stop control. The general guidelines given for a stop sign application begin with using engineering judgment for the installation of a stop sign(s) on a street entering a through highway and where high speeds on the cross street make entry difficult, or due to restricted view, or when crash records indicate a need for control by a stop sign. Further guidance criteria found in the California MUTCD include the following important statements: *“YIELD or STOP signs should not be used for speed control... In most cases, the street carrying the lowest volume of traffic should be controlled... A STOP (R1-1) sign is not a ‘cure-all’ and is not a substitute for other traffic control devices. Often, the need for a STOP (R1-1) sign can be eliminated if the sight distance is increased by removing obstructions... A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study... Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal...”*

Collision History

The guidelines for **Multi-way Stop Applications** contained in the California MUTCD regarding collisions, or crashes, require a minimum of five (5) reported crashes occurring in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions, as well as right-angle collisions (i.e., broadside, or head-on) and pedestrian-vehicle collisions. Other types categorized as ‘sideswipe’, ‘rear-end’, and ‘hit object’ collisions are generally not considered susceptible to correction, unless further review indicates otherwise. The latest available collision history was gathered by HCI from the California Highway Patrol (CHP) Statewide Integrated Traffic Records System website (*i-SWITRS*), which is where local jurisdictions such as cities report their collisions. A comprehensive 5-year traffic collision history summary report was prepared for the intersection.

Collision History (continued)

Table 1 (*below*) provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020-21		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Orlando Road at Avondale Road (east)	9/5/21	Other (DUI) / No		None reported		None reported		None reported

Notes: Information above is derived per the latest 5-year intersection traffic collision database report gathered from CHP-SWITRS (*i-SWITRS website*).

- 1) Type of Coll. = Type of Collision (*i.e., broadside, rear-end, etc.*)
- 2) Correctible? = Yes / No

As shown above, there has been (1) reported ‘non-correctible’ collision in 2021 at or near this intersection over the past (5) years of available SWITRS collision data. Since the collision warrant requires a minimum of (5) reported crashes susceptible to correction by a multi-way stop to occur within a 12-month period, the collision warrant is not satisfied.

The SWITRS traffic collision data report is included in Appendix B.

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts to the intersection on Saturday, February 1, 2025, as well as on Tuesday, February 11, 2025, including pedestrian counts, in order to account for traffic that typically uses this T-intersection. The higher Tuesday ADT approach count for Orlando Road is 1,402 vehicles per day with the highest AM peak-hour approach volume having 203 vehicles, and 198 vehicles in the PM peak-hour. The ADT approach count for Avondale Road (east) is 64 vehicles with the highest AM peak-hour approach volume having 5 vehicles, and 10 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes.

All traffic volume data collected for this intersection is included in Appendix C.

Traffic Volumes (continued)

TABLE 2
HIGHEST 24-HOUR INTERSECTION APPROACH VEHICLE COUNTS

Street	Direction	ADT Volume	Directional Split	Highest Hourly Volume
Orlando Road	Eastbound	649	46%	135 (5 – 6PM)
	Westbound	753	54%	147 (8 – 9AM)
Avondale Road (east)	Northbound	64	100%	10 (1 - 2PM)

Orlando Road is considered the ‘through’ or ‘major’ street at this residential T-intersection since it carries higher volumes from both approaches, and drivers are not required to slow down, or even stop, before proceeding straight through the intersection. In comparison, Avondale Road (east) is considered the ‘minor’ street as northbound drivers on Avondale Road should slow to a stop at Orlando Road and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the traffic volumes on the minor street are significantly less than those on the major street. As can be seen from the table above, this is the case, as Avondale Road (east) carries approximately 4% of the entire vehicular traffic entering the intersection (Orlando Road carries 96% of entering vehicular traffic).

A part of the California MUTCD guideline criteria also calls for a reduction in the required minimum volumes when the critical approach speed (*or 85th-percentile speed*) on the major street exceeds 40 MPH. If this is the case, the minimum vehicular volumes to be met for a multiway stop sign installation are reduced to 70%. As mentioned, the posted speed on Orlando Road is 30 MPH. Field observations during our site visit also confirmed drivers were not regularly speeding over the speed limit near the intersection, but were considered typical and what may be expected for a two-lane collector-type roadway. As the speed limit is less than the 40+ MPH limit required to reduce traffic volumes, the 70% minimum volumes for a multi-way stop sign analysis are not applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the highest hourly vehicle traffic counts shown in Table 2 above are given for the highest one-hour of traffic for each direction, and serve as a good indicator to compare with the required minimum hourly traffic volumes in the California MUTCD multi-way stop guidelines. It must also be mentioned that the average hourly minimum volumes for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour in a day).

Table 3 below shows the California MUTCD minimum traffic volume guidelines for a Multi-way Stop Application in comparison with the highest 8-hour traffic count data collected at this intersection. Both Parts 1 and 2 of the minimum volume warrants below must be satisfied in order to fulfill the traffic volume warrant.

TABLE 3
MULTIWAY STOP SIGN WARRANT FOR MINIMUM TRAFFIC VOLUMES
ORLANDO ROAD AT AVONDALE ROAD (east)

<p style="text-align: center;">Part 1.</p> <p>The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any (8) hours of an average day,</p> <p style="text-align: center;">Results:</p> <p>No, average (123) vehicles per hour</p> <p>Only 41% of the required hourly traffic volume</p>	<i>and</i>	<p style="text-align: center;">Part 2.</p> <p>The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same (8) hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour,</p> <p style="text-align: center;">Results:</p> <p>No, average (7) vehicles per hour</p> <p>Only 3.5% of the required hourly traffic volume</p>	<i>but</i>	<p style="text-align: center;">Part 3.</p> <p>If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are (70) percent of the above values.</p> <p style="text-align: center;">Results:</p> <p>Not Applicable... 85th percentile speed on major-street does not exceed 40 mph</p>
--	------------	---	------------	--

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*41% major street / 3.5% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

Impaired visibility, or restricted sight distance, due to the geometry of the intersection and possible obstructions was carefully considered during our field-review of the surrounding residential/Huntington Library property environment. The geometry of the intersection does not include a typical 90° angle, but more of an obtuse angle. Both roadways intersect in a rather flat area, with very slight inclines going away from the intersection.

Driver sight distance was measured from the side-street approach to the intersection, as northbound traffic on Avondale Road (east) should slow to as stop, before proceeding to make a left-turn or right-turn onto Orlando Road. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD (*see Appendix D*). In this reference, a 30 MPH roadway speed recommends a minimum Stopping Sight Distance of 200 feet. However, it is likely that the 85th percentile speeds typically exceed the 30 MPH posted speed limit on Orlando Road. Therefore, a 35 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 250 feet. This 250-foot distance was used when looking towards approaching, uncontrolled traffic along Orlando Road. More specifically, this stopping sight distance was field-measured from a typical ‘stopped’ vehicle location on Avondale Road (east) at the intersection looking towards the oncoming lanes of cross-traffic on Orlando Road. An orange cone was placed at this distance and a photograph was taken from a stopped driver’s perspective (i.e., approx. 3.5 feet in height). (*See sight distance photos in Exhibits 3 & 4 on the following pages*). As Exhibit 3 shows, when looking from Avondale Road (east), a driver does not have a clear line of sight to the 250 foot sight distance when looking easterly on Orlando Road due to parkway bushes/vegetation. Also, Exhibit 4 shows the 250-foot sight distance, from a westbound driver’s perspective on Orlando Road, to the proposed pedestrian crossing location where the City has recently installed new ADA-compliant pedestrian curb ramps.

EXHIBIT 3

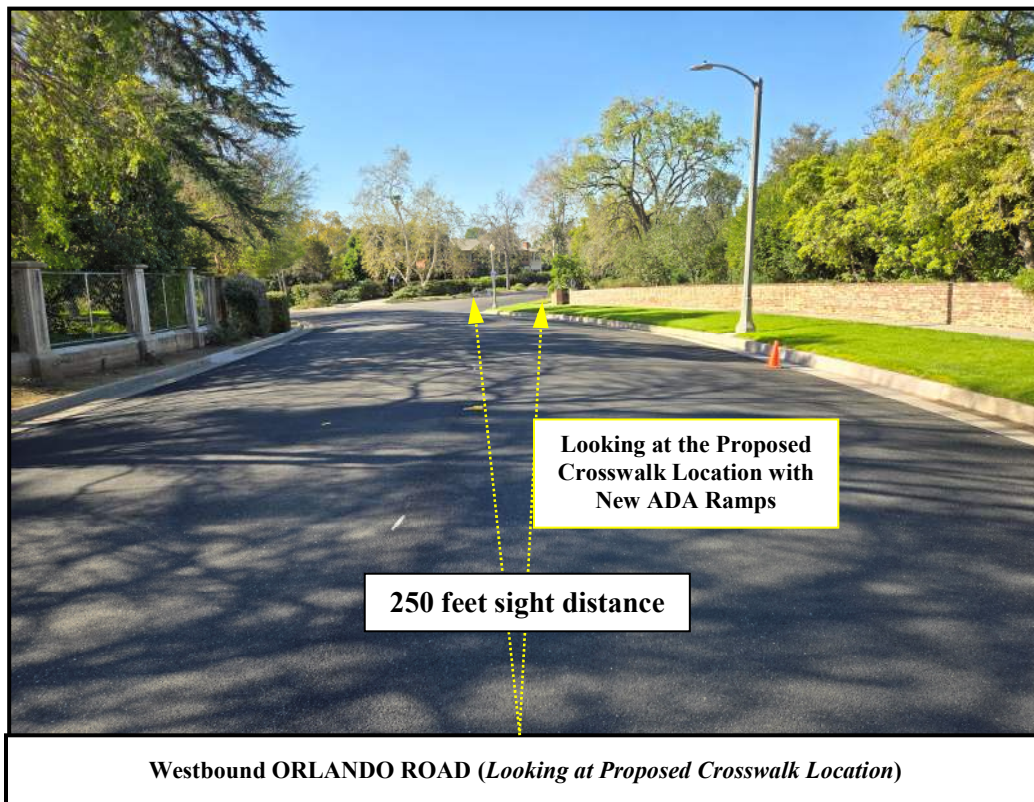


Northbound AVONDALE ROAD east (*Looking East*) at ORLANDO ROAD



Northbound AVONDALE ROAD east (*Looking West*) at ORLANDO ROAD

EXHIBIT 4



MULTIWAY STOP ANALYSIS SUMMARY

The analysis of the four (4) main criteria provided in the California MUTCD regarding **Multi-way Stop Applications** showed that this intersection did not meet the minimum guidelines to justify stopping the major roadway (i.e., Orlando Road). The four main criteria analyzed were: 1) As an interim measure where traffic control signals are justified; 2) Reported collisions – a correctible crash problem; 3) Traffic and pedestrian volumes, speeds, and delay; and 4) Where a combination of the above criteria are satisfied to 80 percent.

In summary, the collision history at the intersection resulted in one (1) SWITRS-reported ‘non-correctible’ collision during the last five years of available data, where the minimum guideline calls for at least five (5) correctible collisions in a 12-month period. The average minimum hourly street volumes required for a multi-way stop to be satisfied for any eight (8) hours in an average day did not come close to being satisfied both on a weekday as well as on a weekend day. Excessive delay to any approach was not observed in terms of vehicles stopping and waiting for a gap on the major roadway due to the overall lower traffic volumes.

Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal is not justified as an interim measure at this intersection (as mentioned in 1) above). The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. In general, if the California MUTCD criteria are not met, the location is typically not recommended for installation of a multi-way stop.

However, engineering judgment should always be included in any decision regarding traffic safety improvements. Intersection lighting was also verified and found to be adequate as there are several nearby street lights located along the north-side of Orlando Road, as well as on the south-side west of Avondale Road (east).

MULTIWAY STOP ANALYSIS SUMMARY (continued)

It was also determined that northbound Avondale Road (east) drivers do not have a clear line of sight to the 250 foot sight distance when looking easterly on Orlando Road due to parkway bushes/vegetation. It may be remedied by removing the small bush located on the south-side parkway. The sight distance is clear for a driver looking westerly.

In regards to pedestrian and bicycle activity, field observations confirmed a low-to-medium activity of pedestrians that actually crossed the streets in all directions. In addition, 12-hour pedestrian data was also collected on a Saturday and a Tuesday, which resulted in a total of 73 pedestrians (Saturday) and 47 pedestrians (Tuesday) crossing the uncontrolled streets at/near the intersection in all directions. The numbers translate to approximately 6 pedestrians and 4 pedestrians crossing per hour, respectively. In anticipation of a new marked crosswalk on the west leg of Orlando Road, the City recently installed ADA-compliant pedestrian curb ramps as part of the City's Roadway Rehabilitation Improvements project (as shown in Exhibit 4). It is noted, the proposed crosswalk installation may be achieved if this intersection is 3-Way Stop controlled, or if it is 1-Way Stop controlled.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Orlando Road at Avondale Road (east) is not required to enhance the traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multiway (3-way) stop sign installation is not recommended for the intersection of Orlando Road and Avondale Road (east). However, in order to better assign right-of-way at this uncontrolled intersection, the installation of a STOP sign, STOP pavement marking, and limit line is recommended for the side-street northbound approach of Avondale Road (east).

RECOMMENDATION (continued)

In order to improve sight distance for northbound Avondale Road drivers, it is also recommended to remove the parkway bush located on the south-side of Orlando Road, east of Avondale Road (east) as shown in Exhibit 3.

Lastly, at this location, there are approximately 62 pedestrians crossing Orlando Road on a weekend day (Saturday), and 36 pedestrians crossing Orlando Road on a weekday (Tuesday). Because of the pedestrian demand and unique intersection geometry, a high-visibility marked crosswalk is recommended for the intersection of Orlando Road and Avondale Road (east). More specifically, the recommendation is to install a white, high visibility marked crosswalk with ladder style bars across the west leg of Orlando Road to channelize pedestrian crossings. The marked crosswalk recommendation includes applicable PED XING fluorescent yellow warning signs (W11-2 symbol signs) posted. Additionally, on each Orlando Road approach in advance of the newly marked crosswalk, installation of YIELD HERE TO PEDESTRIANS (R1-5 signs) with applicable Yield pavement markings, as well as PED XING AHEAD posted signs with applicable pavement markings are recommended. Lastly, the new marked crosswalk is recommended to be supplemented by a solar-powered, pedestrian-push-button-activated Rectangular Rapid Flashing Beacons (RRFB) system to increase crossing awareness for drivers approaching the intersection. *(An exhibit of the above recommendations is included in Appendix E for the City's consideration).*

The cost for engineering design, construction administration, and installation of the new marked crosswalk, applicable roadway warning signage/markings, and RRFB system, is estimated at \$20,000.00. If the City approves these recommendations, the preparation of an engineered signing & striping plan is recommended to detail their proper installation.

APPENDIX A

MULTIWAY STOP APPLICATIONS GUIDELINES:

CALIFORNIA MUTCD

Standard:

03 Except as provided in Paragraphs 4 and 5, the minimum sizes for regulatory signs facing traffic on multi-lane conventional roads shall be as shown in the Multi-lane column of Table 2B-1 and 2B-1(CA).

Option:

04 Where the posted speed limit is 35 mph or less on a multi-lane highway or street, other than for a STOP sign, the minimum size shown in the Single Lane column in Table 2B-1 and 2B-1(CA) may be used.

05 Where a regulatory sign, other than a STOP sign, is placed on the left-hand side of a multi-lane roadway in addition to the installation of the same regulatory sign on the right-hand side or the roadway, the size shown in the Single Lane column in Table 2B-1 and 2B-1(CA) may be used for both the sign on the right-hand side and the sign on the left-hand side of the roadway.

Standard:

06 A minimum size of 36 x 36 inches shall be used for STOP signs that face multi-lane approaches.

07 Where side roads intersect a multi-lane street or highway that has a speed limit of 45 mph or higher, the minimum size of the STOP signs facing the side road approaches, even if the side road only has one approach lane, shall be 36 x 36 inches.

08 Where side roads intersect a multi-lane street or highway that has a speed limit of 40 MPH or lower, the minimum size of the STOP signs facing the side road approaches shall be as shown in the Single Lane or Multi-lane columns of Table 2B-1 and 2B-1(CA) based on the number of approach lanes on the side street approach.

Guidance:

09 The minimum sizes for regulatory signs facing traffic on exit and entrance ramps should be as shown in the column of Table 2B-1 and 2B-1(CA) that corresponds to the mainline roadway classification (Expressway or Freeway). If a minimum size is not provided in the Freeway column, the minimum size in the Expressway column should be used. If a minimum size is not provided in the Freeway or Expressway Column, the size in the Oversized column should be used.

Section 2B.04 Right-of-Way at Intersections

Support:

01 State or local laws written in accordance with the "Uniform Vehicle Code" (see Section 1A.11) establish the right-of-way rule at intersections having no regulatory traffic control signs such that the driver of a vehicle approaching an intersection must yield the right-of-way to any vehicle or pedestrian already in the intersection. When two vehicles approach an intersection from different streets or highways at approximately the same time, the right-of-way rule requires the driver of the vehicle on the left to yield the right-of-way to the vehicle on the right. The right-of-way can be modified at through streets or highways by placing YIELD (R1-2) signs (see Sections 2B.08 and 2B.09) or STOP (R1-1) signs (see Sections 2B.05 through 2B.07) on one or more approaches.

Guidance:

02 Engineering judgment should be used to establish intersection control. The following factors should be considered:

- A. Vehicular, bicycle, and pedestrian traffic volumes on all approaches;
- B. Number and angle of approaches;
- C. Approach speeds;
- D. Sight distance available on each approach; and
- E. Reported crash experience.

03 YIELD or STOP signs should be used at an intersection if one or more of the following conditions exist:

- A. An intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;
- B. A street entering a designated through highway or street; and/or
- C. An unsignalized intersection in a signalized area.

04 In addition, the use of YIELD or STOP signs should be considered at the intersection of two minor streets or local roads where the intersection has more than three approaches and where one or more of the following conditions exist:

- A. The combined vehicular, bicycle, and pedestrian volume entering the intersection from all approaches averages more than 2,000 units per day;
 - B. The ability to see conflicting traffic on an approach is not sufficient to allow a road user to stop or yield in compliance with the normal right-of-way rule if such stopping or yielding is necessary; and/or
 - C. Crash records indicate that five or more crashes that involve the failure to yield the right-of-way at the intersection under the normal right-of-way rule have been reported within a 3-year period, or that three or more such crashes have been reported within a 2-year period.
- ⁰⁵ *YIELD or STOP signs should not be used for speed control.*

Support:

- ⁰⁶ Section 2B.07 contains provisions regarding the application of multi-way STOP control at an intersection.

Guidance:

⁰⁷ *Once the decision has been made to control an intersection, the decision regarding the appropriate roadway to control should be based on engineering judgment. In most cases, the roadway carrying the lowest volume of traffic should be controlled.*

⁰⁸ *A YIELD or STOP sign should not be installed on the higher volume roadway unless justified by an engineering study.*

Support:

⁰⁹ The following are considerations that might influence the decision regarding the appropriate roadway upon which to install a YIELD or STOP sign where two roadways with relatively equal volumes and/or characteristics intersect:

- A. Controlling the direction that conflicts the most with established pedestrian crossing activity or school walking routes;
- B. Controlling the direction that has obscured vision, dips, or bumps that already require drivers to use lower operating speeds; and
- C. Controlling the direction that has the best sight distance from a controlled position to observe conflicting traffic.

Standard:

¹⁰ **Because the potential for conflicting commands could create driver confusion, YIELD or STOP signs shall not be used in conjunction with any traffic control signal operation., except in the following cases:**

- A. If the signal indication for an approach is a flashing red at all times;**
- B. If a minor street or driveway is located within or adjacent to the area controlled by the traffic control signal, but does not require separate traffic signal control because an extremely low potential for conflict exists; or**
- C. If a channelized turn lane is separated from the adjacent travel lanes by an island and the channelized turn lane is not controlled by a traffic control signal.**

^{10a} **STOP signs shall not be erected at any entrance to an intersection controlled by traffic signals. Refer to CVC 21355(a).**

Option:

^{10b} **YIELD or STOP signs may be used at a channelized turn lane if it is separated from the adjacent travel lanes moving in same direction by an island and the channelized turn lane is not controlled by a traffic control signal.**

Standard:

¹¹ **Except as provided in Section 2B.09, STOP signs and YIELD signs shall not be installed on different approaches to the same unsignalized intersection if those approaches conflict with or oppose each other.**

¹² **Portable or part-time STOP or YIELD signs shall not be used except for emergency and temporary traffic control zone purposes.**

¹³ **A portable or part-time (folding) STOP sign that is manually placed into view and manually removed from view shall not be used during a power outage to control a signalized approach unless the maintaining agency establishes that the signal indication that will first be displayed to that approach upon restoration of power is a flashing red signal indication and that the portable STOP sign will be manually removed from view prior to stop-and-go operation of the traffic control signal.**

Option:

14 A portable or part-time (folding) STOP sign that is electrically or mechanically operated such that it only displays the STOP message during a power outage and ceases to display the STOP message upon restoration of power may be used during a power outage to control a signalized approach.

Support:

15 Section 9B.03 contains provisions regarding the assignment of priority at a shared-use path/ roadway intersection.

Section 2B.05 STOP Sign (R1-1) and ALL WAY Plaque (R1-3P)

Standard:

01 When it is determined that a full stop is always required on an approach to an intersection, a STOP (R1-1) sign (see Figure 2B-1) shall be used.

02 The STOP sign shall be an octagon with a white legend and border on a red background.

03 Secondary legends shall not be used on STOP sign faces.

04 At intersections where all approaches are controlled by STOP signs (see Section 2B.07), an ALL WAY supplemental plaque (R1-3P) shall be mounted below each STOP sign. The ALL WAY plaque (see Figure 2B-1) shall have a white legend and border on a red background.

05 The ALL WAY plaque shall only be used if all intersection approaches are controlled by STOP signs.

06 Supplemental plaques with legends such as 2-WAY, 3-WAY, 4-WAY, or other numbers of ways shall not be used with STOP signs.

Support:

07 The use of the CROSS TRAFFIC DOES NOT STOP (W4-4P) plaque (and other plaques with variations of this word message) is described in Section 2C.59.

Guidance:

08 Plaques with the appropriate alternative messages of *TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4aP)* or *ONCOMING TRAFFIC DOES NOT STOP (W4-4bP)* should be used at intersections where STOP signs control all but one approach to the intersection, unless the only non-stopped approach is from a one-way street.

Option:

09 An EXCEPT RIGHT TURN (R1-10P) plaque (see Figure 2B-1) may be mounted below the STOP sign if an engineering study determines that a special combination of geometry and traffic volumes is present that makes it possible for right-turning traffic on the approach to be permitted to enter the intersection without stopping.

Support:

10 The design and application of Stop Beacons are described in Section 4L.05.

11 A STOP (R1-1) sign is not a "cure-all" and is not a substitute for other traffic control devices. Often, the need for a STOP (R1-1) sign can be eliminated if the sight distance is increased by removing obstructions.

Through Highways

Option:

12 STOP (R1-1) signs may be installed either at or near the entrance to a State highway, except at signalized intersections, or at any location so as to control traffic within an intersection. Refer to CVC 21352 and 21355. See Section 1A.11 for information regarding this publication.

Support:

13 When STOP (R1-1) signs or traffic control signals have been erected at all entrances, a highway constitutes a through highway. Refer to CVC 600.

14 Authority to place STOP (R1-1) signs facing State highway traffic is delegated to the Caltrans District Directors.

Option:

15 Local authorities may designate any highway under their jurisdiction as a through highway and install STOP (R1-1) signs in a like manner. Refer to CVC 21354.

Standard:

16 No local authority shall erect or maintain any STOP (R1-1) sign or other traffic control device requiring a stop, on any State highway, except by permission of Caltrans. Refer to CVC 21353.

Support:

- ¹⁷ Caltrans will grant such permission only when an investigation indicates that the STOP (R1-1) sign will benefit traffic.

Section 2B.06 STOP Sign Applications

Guidance:

- ⁰¹ At intersections where a full stop is not necessary at all times, consideration should first be given to using less restrictive measures such as YIELD signs (see Sections 2B.08 and 2B.09).
- ⁰² The use of STOP signs on the minor-street approaches should be considered if engineering judgment indicates that a stop is always required because of one or more of the following conditions:
- A. The vehicular traffic volumes on the through street or highway exceed 6,000 vehicles per day;
 - B. A restricted view exists that requires road users to stop in order to adequately observe conflicting traffic on the through street or highway; and/or
 - C. Crash records indicate that three or more crashes that are susceptible to correction by the installation of a STOP sign have been reported within a 12-month period, or that five or more such crashes have been reported within a 2-year period. Such crashes include right-angle collisions involving road users on the minor-street approach failing to yield the right-of-way to traffic on the through street or highway.

Support:

- ⁰³ The use of STOP signs at grade crossings is described in Sections 8B.04 and 8B.05.

Section 2B.07 Multi-Way Stop Applications

Support:

- ⁰¹ Multi-way stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multi-way stops include pedestrians, bicyclists, and all road users expecting other road users to stop. Multi-way stop control is used where the volume of traffic on the intersecting roads is approximately equal.
- ⁰² The restrictions on the use of STOP signs described in Section 2B.04 also apply to multi-way stop applications.

Guidance:

- ⁰³ The decision to install multi-way stop control should be based on an engineering study.
- ⁰⁴ The following criteria should be considered in the engineering study for a multi-way STOP sign installation:
- A. Where traffic control signals are justified, the multi-way stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.
 - B. Five or more reported crashes in a 12-month period that are susceptible to correction by a multi-way stop installation. Such crashes include right-turn and left-turn collisions as well as right-angle collisions.
 - C. Minimum volumes:
 - 1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day; and
 - 2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour; but
 - 3. If the 85th-percentile approach speed of the major-street traffic exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.
 - D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Option:

- ⁰⁵ Other criteria that may be considered in an engineering study include:
- A. The need to control left-turn conflicts;
 - B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;
 - C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and

- D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multi-way stop control would improve traffic operational characteristics of the intersection.**

Section 2B.08 YIELD Sign (R1-2)

Standard:

01 The YIELD (R1-2) sign (see Figure 2B-1) shall be a downward-pointing equilateral triangle with a wide red border and the legend YIELD in red on a white background.

Support:

02 The YIELD sign assigns right-of-way to traffic on certain approaches to an intersection. Vehicles controlled by a YIELD sign need to slow down to a speed that is reasonable for the existing conditions or stop when necessary to avoid interfering with conflicting traffic.

Section 2B.09 YIELD Sign Applications

Option:

01 YIELD signs may be installed:

- A. On the approaches to a through street or highway where conditions are such that a full stop is not always required.**
- B. At the second crossroad of a divided highway, where the median width at the intersection is 30 feet or greater. In this case, a STOP or YIELD sign may be installed at the entrance to the first roadway of a divided highway, and a YIELD sign may be installed at the entrance to the second roadway.**
- C. For a channelized turn lane that is separated from the adjacent travel lanes by an island, even if the adjacent lanes at the intersection are controlled by a highway traffic control signal or by a STOP sign.**
- D. At an intersection where a special problem exists and where engineering judgment indicates the problem to be susceptible to correction by the use of the YIELD sign.**
- E. Facing the entering roadway for a merge-type movement if engineering judgment indicates that control is needed because acceleration geometry and/or sight distance is not adequate for merging traffic operation.**

Standard:

02 A YIELD (R1-2) sign shall be used to assign right-of-way at the entrance to a roundabout. YIELD signs at roundabouts shall be used to control the approach roadways and shall not be used to control the circulatory roadway.

03 Other than for all of the approaches to a roundabout, YIELD signs shall not be placed on all of the approaches to an intersection.

Section 2B.10 STOP Sign or YIELD Sign Placement

Standard:

01 The STOP or YIELD sign shall be installed on the near side of the intersection on the right-hand side of the approach to which it applies. When the STOP or YIELD sign is installed at this required location and the sign visibility is restricted, a Stop Ahead sign (see Section 2C.36) shall be installed in advance of the STOP sign or a Yield Ahead sign (see Section 2C.36) shall be installed in advance of the YIELD sign.

02 The STOP or YIELD sign shall be located as close as practical to the intersection it regulates, while optimizing its visibility to the road user it is intended to regulate.

02a YIELD signs shall not be erected upon the approaches to more than one of the intersecting streets. Refer to CVC 21356.

03 STOP signs and YIELD signs shall not be mounted on the same post.

04 No items other than inventory stickers, sign installation dates, and bar codes shall be affixed to the fronts of STOP or YIELD signs, and the placement of these items shall be in the border of the sign.

05 No items other than official traffic control signs, inventory stickers, sign installation dates, anti-vandalism stickers, and bar codes shall be mounted on the backs of STOP or YIELD signs.

06 No items other than retroreflective strips (see Section 2A.21) or official traffic control signs shall be mounted on the fronts or backs of STOP or YIELD signs supports.

APPENDIX B

SWITRS COLLISION HISTORY

CITY OF SAN MARINO
INTERSECTION OF ORLANDO ROAD AND AVONDALE ROAD
5-YEAR SWITRS COLLISION DATABASE
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTER.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL. CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.
9416517	20210905	41	ORLANDO RD	AVONDALE RD	0		Y	A	4	A	1	23152	N	H	I	A

NOTES:

Weather 1
A - Clear
B - Cloudy
C - Raining
D - Snowing
E - Fog
F - Other
G - Wind
- - Not Stated

Collision Severity
1 - Fatal
2 - Injury (Severe)
3 - Injury (Other Visible)
4 - Injury (Complaint of Pain)
0 - PDO (Property Damage Only)

Primary Collision Factor
A - (Vehicle) Code Violation
B - Other Improper Driving
C - Other Than Driver
D - Unknown
E - Fell Asleep
- - Not Stated

PCF Violation Category
01 - Driving or Bicycling Under Influence
02 - Impeding Traffic
03 - Unsafe Speed
04 - Following Too Closely
05 - Wrong Side of Road
06 - Improper Passing
07 - Unsafe Lane Change
08 - Improper Turning
09 - Automobile ROW
10 - Pedestrian ROW
11 - Pedestrian Violation
12 - Traffic Signals and Signs
13 - Hazardous Parking
14 - Lights
15 - Brakes
16 - Other Equipment
17 - Other Hazardous Violation
18 - Other Than Driver (or Ped)
19 -
20 -
21 - Unsafe Starting or Backing
22 - Other Improper Driving
23 - Pedestrian or "Other" Under the Influence
24 - Fell Asleep
00 - Unknown
- - Not Stated

Hit and Run
F - Felony
M - Misdemeanor
N - Not Hit & Run

Type of Collision
A - Head-On
B - Sideswipe
C - Rear-End
D - Broadside
E - Hit Object
F - Overturned
G - Vehicle/Pedestrian
H - Other
- - Not Stated

Motor Vehicle Involved With:
A - Non-Collision
B - Pedestrian
C - Other Motor Vehicle
D - Motor Vehicle on Other Roadway
E - Parked Motor Vehicle
F - Train
G - Bicycle
H - Animal
I - Fixed Object
J - Other Object
- - Not Stated

Road Surface
A - Dry
B - Wet
C - Snowy or Icy
D - Slippery
- - Not Stated

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT) & PEDESTRIAN COUNT DATA

VOLUME

Avondale Rd & Orlando Rd

Day: Saturday

Date: 2/1/2025

Highest 8 Hours.

City: San Marino

Project #: CA25_020032_001

DAILY TOTALS					NB	SB						EB	WB	Total
					97	0						585	693	1,375
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL		
0:00	0		3	2	5		12:00	1		25	12	38		
0:15	0		0	1	1		12:15	3		21	14	38		
0:30	0		0	1	1		12:30	3		20	17	40		
0:45	0		0	3	0	4	12:45	2	9	19	85	23	66	44 160
1:00	0		0	0	0		13:00	2		18	16	36		
1:15	0		0	0	0		13:15	2		19	19	40		
1:30	0		0	0	0		13:30	3		17	22	42		
1:45	0		0	0	0		13:45	5	12	21	75	27	84	53 171
2:00	0		0	0	0		14:00	4		21	24	49		
2:15	0		0	0	0		14:15	4		17	25	46		
2:30	0		0	0	0		14:30	1		23	17	41		
2:45	0		0	0	0		14:45	5	14	20	81	12	78	37 173
3:00	0		0	0	0		15:00	1		19	17	37		
3:15	0		0	0	0		15:15	5		15	25	45		
3:30	0		0	0	0		15:30	5		11	20	36		
3:45	0		0	0	0		15:45	3	14	6	51	17	79	26 144
4:00	0		0	0	0		16:00	2		11	16	29		
4:15	0		0	1	1		16:15	6		7	24	37		
4:30	0		0	0	0		16:30	3		6	24	33		
4:45	0		0	0	0	1	16:45	3	14	10	34	28	92	41 140
5:00	0		1	1	2		17:00	3		3	26	32		
5:15	0		0	0	0		17:15	1		3	17	21		
5:30	0		2	0	2		17:30	1		6	23	30		
5:45	0		1	4	0	1	17:45	4	9	3	15	11	77	18 101
6:00	0		1	0	1		18:00	0		7	9	16		
6:15	0		1	1	2		18:15	1		6	3	10		
6:30	1		0	3	4		18:30	0		4	11	15		
6:45	0	1	0	2	3	7	18:45	0	1	1	18	4	27	5 46
7:00	0		1	1	2		19:00	1		3	7	11		
7:15	1		1	2	4		19:15	0		3	4	7		
7:30	0		5	7	12		19:30	1		1	5	7		
7:45	0	1	4	11	4	14	19:45	0	2	1	8	6	22	7 32
8:00	1		13	5	19		20:00	2		0	6	8		
8:15	0		4	8	12		20:15	1		5	7	13		
8:30	0		2	4	6		20:30	1		3	4	8		
8:45	1	2	9	28	2	19	20:45	0	4	0	8	1	18	1 30
9:00	0		7	5	12		21:00	0		0	6	6		
9:15	2		11	6	19		21:15	1		1	1	3		
9:30	0		4	5	9		21:30	0		2	1	3		
9:45	1	3	13	35	6	22	21:45	0	1	0	3	0	8	0 12
10:00	0		13	7	20		22:00	0		2	2	4		
10:15	2		16	8	26		22:15	0		4	1	5		
10:30	2		20	9	31		22:30	0		2	0	2		
10:45	0	4	16	65	8	32	22:45	1	1	3	11	0	3	4 15
11:00	0		14	12	26		23:00	0		0	0	0		
11:15	0		9	5	14		23:15	0		2	0	2		
11:30	4		9	10	23		23:30	0		0	1	1		
11:45	1	5	13	45	9	36	23:45	0		1	3	2	3	3 6
TOTALS	16		193	136	345		TOTALS	81		392	557	1030		
SPLIT %	4.6%		55.9%	39.4%	25.1%		SPLIT %	7.9%		38.1%	54.1%	74.9%		

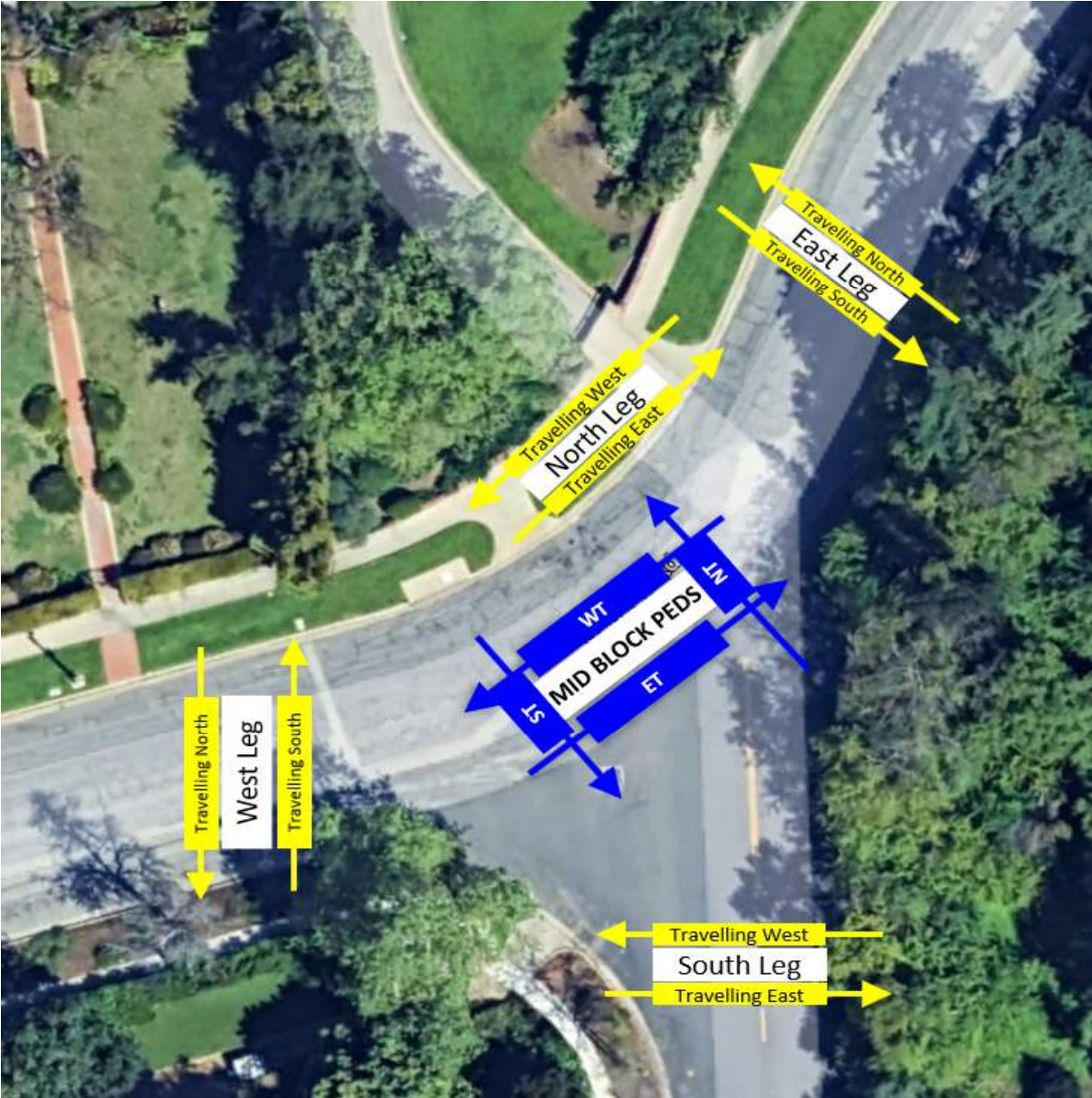
DAILY TOTALS					NB	SB						EB	WB	Total
					97	0						585	693	1,375
AM Peak Hour	11:30		11:45	11:45	11:45		PM Peak Hour	13:30		12:00	16:15	13:30		
AM Pk Volume	9		79	52	139		PM Pk Volume	16		85	102	190		
Pk Hr Factor	0.563		0.790	0.765	0.869		Pk Hr Factor	0.800		0.850	0.911	0.896		
7 - 9 Volume	3	0	39	33	75		4 - 6 Volume	23	0	49	169	241		
7 - 9 Peak Hour	7:15		8:00	7:30	7:30		4 - 6 Peak Hour	16:15		16:00	16:15	16:15		
7 - 9 Pk Volume	2	0	28	24	51		4 - 6 Pk Volume	15	0	34	102	143		
Pk Hr Factor	0.500	0.000	0.538	0.750	0.671		Pk Hr Factor	0.625	0.000	0.773	0.911	0.872		

Pedestrian Study

Location: Avondale Rd & Orlando Rd
City: San Marino, CA

Date: 2/1/2025
Day: Saturday

TIME	Pedestrian												TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		Mid-Block Peds				
	EB	WB	EB	WB	NB	SB	NB	SB	NT	ST	ET	WT	
7:00 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	3	0	0	0	0	0	0	0	0	1	0	4
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	1
7:45 AM	2	1	0	0	0	0	0	0	0	0	2	0	5
8:00 AM	4	3	0	0	0	0	0	0	0	0	0	0	7
8:15 AM	1	4	1	0	0	0	0	0	0	0	0	0	6
8:30 AM	1	1	0	1	0	0	0	0	0	0	0	0	3
8:45 AM	1	1	0	1	1	0	0	0	0	0	0	0	4
9:00 AM	1	2	0	0	0	0	0	0	0	0	0	0	3
9:15 AM	1	0	0	0	0	0	1	0	0	0	0	0	2
9:30 AM	2	1	0	0	0	0	0	1	0	0	0	0	4
9:45 AM	3	3	0	0	0	0	0	2	0	0	0	0	8
10:00 AM	1	9	0	0	0	0	0	0	0	0	0	0	10
10:15 AM	1	4	0	0	0	1	0	1	0	0	0	0	7
10:30 AM	1	2	0	0	0	0	1	0	0	1	0	1	6
10:45 AM	4	7	0	0	0	0	0	0	0	0	0	0	11
11:00 AM	3	5	0	0	0	0	0	0	0	0	0	0	8
11:15 AM	2	2	0	0	0	0	0	0	1	2	0	1	8
11:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
12:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	2
12:15 PM	0	1	0	0	0	0	0	1	0	0	0	0	2
12:30 PM	3	2	0	0	0	0	1	0	0	0	0	0	6
12:45 PM	3	3	0	0	0	0	0	0	2	0	0	0	8
1:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
1:15 PM	1	0	2	0	2	0	0	0	0	0	0	0	5
1:30 PM	2	1	0	0	0	0	1	0	0	0	0	0	4
1:45 PM	6	3	0	0	1	0	0	0	0	0	0	0	10
2:00 PM	2	1	0	0	3	0	0	0	6	0	0	0	12
2:15 PM	0	1	1	0	0	0	0	0	0	1	0	0	3
2:30 PM	2	3	0	0	1	0	1	0	0	0	0	0	7
2:45 PM	1	4	0	0	0	0	0	0	0	2	0	0	7
3:00 PM	2	0	0	0	0	0	0	0	0	0	0	0	2
3:15 PM	4	2	0	0	0	0	2	0	0	2	0	0	10
3:30 PM	4	2	0	0	0	2	0	1	0	1	0	0	10
3:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
4:00 PM	2	2	0	0	1	2	1	0	0	0	0	0	8
4:15 PM	0	0	0	0	0	4	0	0	0	0	0	0	4
4:30 PM	0	3	0	0	0	0	0	0	0	0	0	0	3
4:45 PM	0	3	0	0	0	0	0	0	0	2	0	0	5
5:00 PM	2	2	0	0	0	2	1	0	0	0	0	0	7
5:15 PM	3	8	0	0	0	0	0	1	1	0	0	0	13
5:30 PM	3	1	0	0	0	1	0	0	0	0	0	0	5
5:45 PM	0	2	0	0	0	1	0	0	0	0	0	0	3
6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	2	0	0	0	0	0	0	0	1	0	0	3
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	69	103	4	3	9	13	9	7	10	14	1	3	245



VOLUME

Avondale Rd & Orlando Rd

Day: Tuesday
Date: 2/11/2025

Highest 8 Hours.

City: San Marino
Project #: CA25_020032_001

DAILY TOTALS					NB	SB						EB	WB	Total	
					64	0						649	753	1,466	
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL			
0:00	0		0	0	0		12:00	1		10	9	20			
0:15	0		0	0	0		12:15	0		6	11	17			
0:30	0		0	0	0		12:30	2		6	5	13			
0:45	0		1	1	1	1	12:45	2	5	18	40	30	80		
1:00	0		0	0	0		13:00	2		7	18	27			
1:15	0		0	0	0		13:15	4		9	11	24			
1:30	0		0	0	0		13:30	1		8	10	19			
1:45	0		0	0	0		13:45	3	10	10	34	25	95		
2:00	0		0	0	0		14:00	0		8	10	18			
2:15	0		0	0	0		14:15	4		6	11	21			
2:30	0		0	0	0		14:30	0		7	16	23			
2:45	0		0	0	0		14:45	5	9	14	35	28	90		
3:00	0		0	0	0		15:00	3		6	15	24			
3:15	0		1	0	1		15:15	1		19	19	39			
3:30	0		0	0	0		15:30	1		12	15	28			
3:45	0		0	1	0	1	15:45	0	5	22	59	34	125		
4:00	0		2	0	2		16:00	0		16	22	38			
4:15	0		2	1	3		16:15	2		14	14	30			
4:30	0		0	0	0		16:30	1		11	19	31			
4:45	0		1	5	1	2	16:45	1	4	26	67	38	137		
5:00	0		0	0	0		17:00	3		28	17	48			
5:15	0		1	0	1		17:15	0		30	14	44			
5:30	0		1	0	1		17:30	1		41	13	55			
5:45	1	1	1	3	2	4	17:45	1	5	36	135	56	203		
6:00	0		2	2	4		18:00	1		25	5	31			
6:15	0		0	1	1		18:15	1		12	8	21			
6:30	1		1	3	5		18:30	2		11	5	18			
6:45	0	1	0	3	5	11	18:45	0	4	5	53	9	79		
7:00	1		3	5	9		19:00	0		6	7	13			
7:15	0		3	5	8		19:15	1		5	6	12			
7:30	1		7	17	25		19:30	0		4	4	8			
7:45	1	3	8	21	37	79	19:45	0	1	6	21	9	42		
8:00	0		16	37	53		20:00	1		3	1	5			
8:15	0		18	60	78		20:15	0		1	0	1			
8:30	1		18	27	46		20:30	0		1	4	5			
8:45	1	2	4	56	28	205	20:45	0	1	3	8	4	15		
9:00	1		12	11	24		21:00	0		1	4	5			
9:15	2		10	14	26		21:15	0		3	6	9			
9:30	0		6	15	21		21:30	1		1	8	10			
9:45	0	3	10	38	22	93	21:45	0	1	1	6	3	27		
10:00	2		7	10	19		22:00	0		2	2	4			
10:15	2		8	8	18		22:15	0		0	3	3			
10:30	0		5	10	15		22:30	0		0	1	1			
10:45	0	4	9	29	27	79	22:45	0		2	4	4	12		
11:00	3		8	8	19		23:00	0		0	0	0			
11:15	0		6	14	20		23:15	0		1	0	1			
11:30	2		11	10	23		23:30	0		0	0	0			
11:45	0	5	4	29	14	76	23:45	0		0	1	0	1		
TOTALS	19		186	355	560		TOTALS	45		463	398	906			
SPLIT %	3.4%		33.2%	63.4%	38.2%		SPLIT %	5.0%		51.1%	43.9%	61.8%			

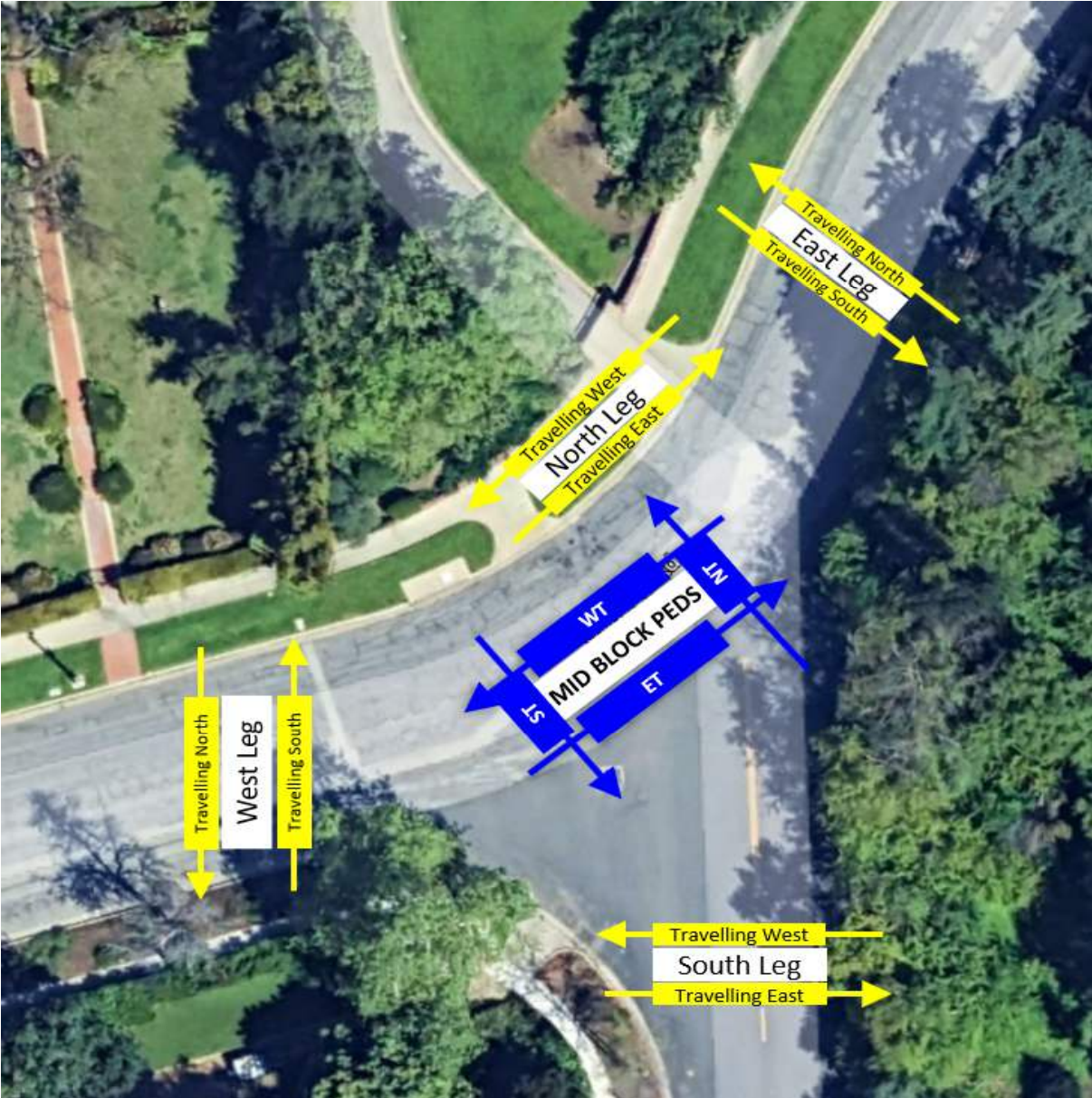
DAILY TOTALS					NB	SB						EB	WB	Total	
					64	0						649	753	1,466	
AM Peak Hour	8:30		7:45	7:45	7:45		PM Peak Hour	14:15		17:00	15:15	17:00			
AM Pk Volume	5		60	152	214		PM Pk Volume	12		135	68	203			
Pk Hr Factor	0.625		0.833	0.633	0.686		Pk Hr Factor	0.600		0.823	0.773	0.906			
7 - 9 Volume	5	0	77	202	284		4 - 6 Volume	9	0	202	129	340			
7 - 9 Peak Hour	7:00		7:45	7:45	7:45		4 - 6 Peak Hour	16:15		17:00	16:00	17:00			
7 - 9 Pk Volume	3	0	60	152	214		4 - 6 Pk Volume	7	0	135	66	203			
Pk Hr Factor	0.750	0.000	0.833	0.633	0.686		Pk Hr Factor	0.583	0.000	0.823	0.750	0.906			

Pedestrian Study

Location: Avondale Rd & Orlando Rd
City: San Marino, CA

Date: 2/11/2025
Day: Tuesday

TIME	Pedestrian												TOTAL
	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		Mid-Block Peds				
	EB	WB	EB	WB	NB	SB	NB	SB	NT	ST	ET	WT	
7:00 AM	0	0	0	0	0	0	0	0	0	0	1	1	2
7:15 AM	3	2	0	0	0	0	0	0	0	0	1	0	6
7:30 AM	1	3	0	0	0	0	0	0	0	0	0	0	4
7:45 AM	4	4	0	0	0	0	0	0	0	0	0	0	8
8:00 AM	2	1	0	0	0	0	0	0	0	1	0	0	4
8:15 AM	1	1	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	7	4	0	0	0	0	0	0	0	0	0	0	11
8:45 AM	1	2	0	0	0	0	0	0	0	3	0	0	6
9:00 AM	0	3	0	0	0	0	0	0	0	0	0	0	3
9:15 AM	0	3	0	0	0	0	0	0	0	2	1	0	6
9:30 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
9:45 AM	1	0	0	0	0	0	0	0	0	0	0	0	1
10:00 AM	2	0	0	0	0	0	0	0	1	0	0	0	3
10:15 AM	0	1	0	0	0	0	0	0	0	1	0	0	2
10:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
10:45 AM	2	4	0	0	0	0	0	0	0	0	0	0	6
11:00 AM	3	5	0	0	0	0	0	1	2	2	0	0	13
11:15 AM	2	0	0	0	0	0	0	0	0	0	0	0	2
11:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45 AM	0	1	0	0	0	0	0	0	0	1	0	1	3
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	1	0	0	1
12:45 PM	2	1	0	1	0	0	0	0	0	0	0	0	4
1:00 PM	3	2	1	0	0	0	0	1	0	0	0	0	7
1:15 PM	2	0	0	0	0	0	0	0	0	0	1	0	3
1:30 PM	1	0	0	0	0	0	1	0	0	0	0	0	2
1:45 PM	0	0	0	0	0	0	1	0	1	0	0	0	2
2:00 PM	2	1	1	0	0	0	0	0	0	0	0	0	4
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	4	1	0	0	0	1	2	0	0	0	0	0	8
2:45 PM	1	3	0	0	0	0	0	2	1	1	0	0	8
3:00 PM	3	1	0	0	0	0	1	0	0	0	0	0	5
3:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
3:30 PM	3	2	0	0	0	0	0	0	0	0	0	0	5
3:45 PM	9	1	0	0	0	0	0	0	1	0	0	0	11
4:00 PM	2	1	0	0	0	0	0	0	0	0	0	0	3
4:15 PM	3	11	0	0	0	0	0	0	0	1	0	0	15
4:30 PM	1	4	0	0	0	0	0	0	0	0	0	0	5
4:45 PM	0	2	1	0	1	0	0	0	0	1	0	0	5
5:00 PM	6	4	0	1	0	0	0	0	1	0	0	0	12
5:15 PM	1	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	2	1	0	0	0	0	0	1	0	0	0	0	4
5:45 PM	3	4	0	0	0	0	1	0	0	1	0	0	9
6:00 PM	0	2	0	0	0	0	0	0	1	0	0	0	3
6:15 PM	2	0	0	0	0	0	0	0	0	0	0	0	2
6:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	2	0	0	0	0	0	0	0	0	0	0	2
Totals	80	83	3	2	1	1	6	5	8	15	4	2	210



APPENDIX D

STOPPING SIGHT DISTANCE AS A FUNCTION OF SPEED

CALIFORNIA MUTCD

Table 6C-1. Recommended Advance Warning Sign ~~Minimum~~ Spacing

Road Type	Distance Between Signs**		
	A	B	C
Urban (low speed) - 25 mph or less***	100 feet	100 feet	100 feet
Urban - more than 25 mph to 40 mph***	250 feet	250 feet	250 feet
Urban (high speed) - more than 40 mph***	350 feet	350 feet	350 feet
Rural	500 feet	500 feet	500 feet
Expressway / Freeway	1,000 feet	1,500 feet	2,640 feet

* ~~Speed category to be determined by the highway agency.~~

** The column headings A, B, and C are the dimensions shown in Figures 6H-1 through 6H-46. The A dimension is the distance from the transition or point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. (The "first sign" is the sign in a three-sign series that is closest to the TTC zone. The "third sign" is the sign that is furthest upstream from the TTC zone.)

*** Posted speed limit, off-peak 85th-percentile speed prior to work starting, or other anticipated operating speed in mph.

**Table 6C-2. Stopping Sight Distance as a Function of Speed on Level Roads.
(Used as suggested longitudinal buffer space length or location for flagger station)**

Speed*	Distance
20 mph	115 feet
25 mph	155 feet
30 mph	200 feet
35 mph	250 feet
40 mph	305 feet
45 mph	360 feet
50 mph	425 feet
55 mph	495 feet
60 mph	570 feet
65 mph	645 feet
70 mph	730 feet
75 mph	820 feet



* Posted speed, off-peak 85th-percentile speed prior to work starting, or the anticipated operating speed in mph.

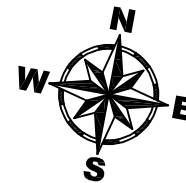
Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

Type of Taper	Taper Length
Merging Taper	at least L
Shifting Taper	at least 0.5 L
Shoulder Taper	at least 0.33 L
One-Lane, Two-Way Traffic Taper	50 feet minimum, 100 feet maximum
Downstream Taper	50 feet minimum, 100 feet maximum

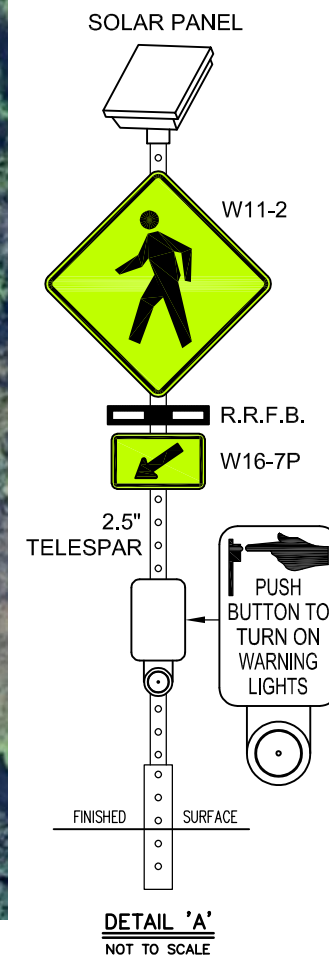
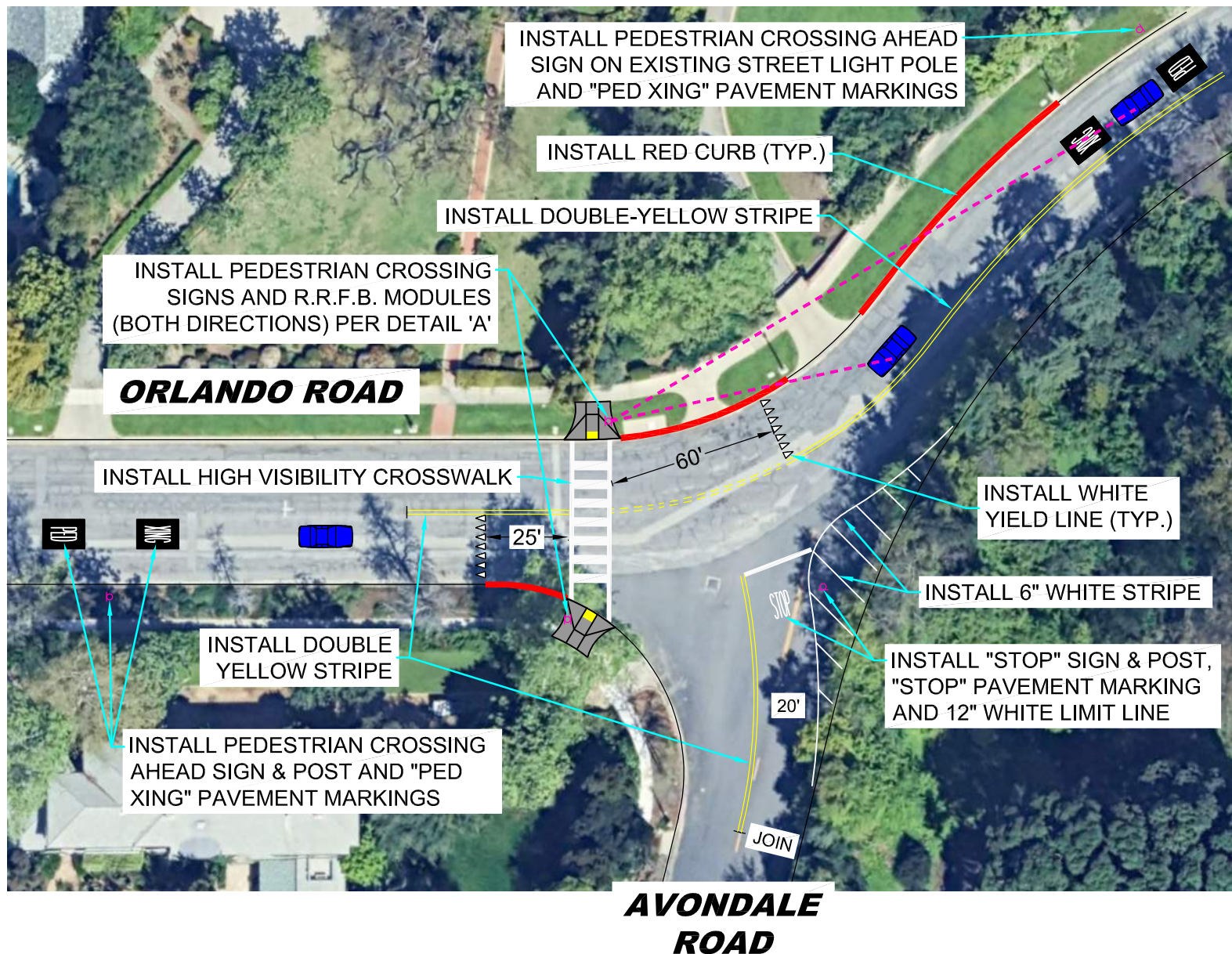
Note: Use Table 6C-4 to calculate L

APPENDIX E

EXHIBIT SHOWING RECOMMENDATIONS



Not to Scale



FILE: AVONDALE EX E.dwg