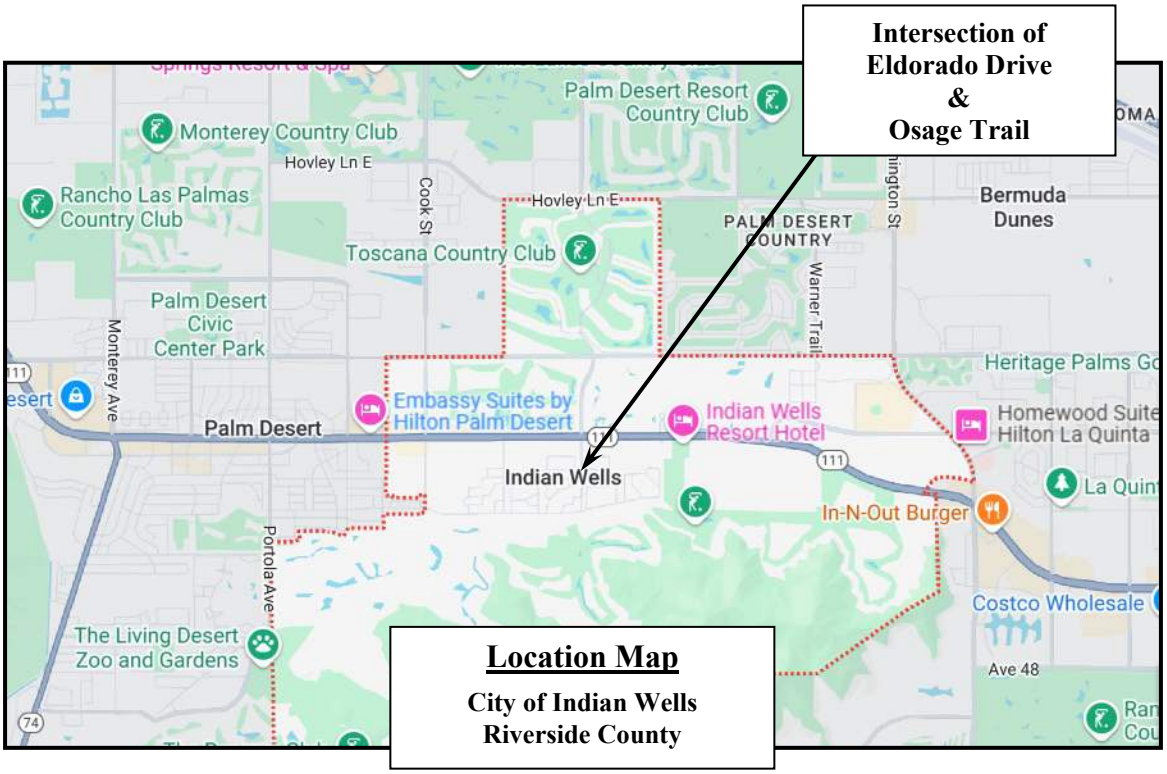
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF ELDORADO DRIVE AND OSAGE TRAIL
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 10, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Eldorado Drive and Osage Trail. This analysis was completed in order to verify if a four-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 4-way intersection with Eldorado Drive running in the north-south directions and Osage Trail in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a two-way STOP sign control installed on Osage Trail.



BACKGROUND

In this segment, **Eldorado Drive** is classified as a north-south major collector roadway with primarily single-family residential properties on both sides of the street. At the subject intersection, the roadway is approximately 86 feet wide. The 4-lane roadway provides for two lanes of traffic and a bicycle lane in each direction, separated by a raised, concrete, landscaped center median for the majority of the segment. The roadway transitions to a 2-lane roadway south Osage Trail. There are no marked crosswalks across Eldorado Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Eldorado Drive has a posted speed limit of 35 MPH, on-street parking is prohibited on both sides of the street via No Parking Any Time posted signs, and there is a No Trucks sign posted near Highway 111. Currently, there are no STOP signs or other types of traffic control on Eldorado Drive (i.e., uncontrolled) at its intersection with Osage Trail.

See Exhibit 1 (next page) for photo images of Eldorado Drive.

Osage Trail is classified as an east-west local roadway with single-family residential properties on both sides of the street. The roadway is approximately 40 feet wide west of Eldorado Drive, and 84 feet wide with a raised center median east of Eldorado Drive. At the intersection, the roadways widen up to approximately 112 feet with larger raised center landscaped entry medians. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Osage Trail. The roadway has curb and gutter improvements on both sides of the street. Osage Trail has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a two-way posted STOP sign installation on Osage Trail, along with a painted STOP marking and limit line, at its intersection with Eldorado Drive.

See Exhibit 2 (following page) for photo images of Osage Trail.

EXHIBIT 1



ELDORADO DRIVE (*Looking Northbound*) at OSAGE TRAIL



ELDORADO DRIVE (*Looking Southbound*) at OSAGE TRAIL

EXHIBIT 2



OSAGE TRAIL (*Looking Eastbound*) at ELDORADO DRIVE



OSAGE TRAIL (*Looking Westbound*) at ELDORADO DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 4-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**
Eldorado Drive at Osage Trail		*None reported*		*None reported*	12/24/23	Hit Object / No		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there has been one (1) reported 'non-correctible' collision 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Eldorado Drive is 3,512 vehicles per day with the highest AM peak-hour volume having 309 vehicles, and 394 vehicles in the PM peak-hour. The bi-directional ADT count for Osage Trail is 944 vehicles with the highest AM peak-hour volume having 99 vehicles, and 101 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Eldorado Drive	Northbound	1,657	47%	259 (3 - 4 PM)
	Southbound	1,855	53%	206 (8 - 9 AM)
Osage Trail	Eastbound	457	48%	53 (11 AM - 12 PM)
	Westbound	487	52%	53 (12 - 1 PM)

Eldorado Drive is considered the 'through' or 'major' street at this residential 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, Osage Trail is considered the 'minor' street as drivers on Osage Trail should stop at Eldorado Drive and look both ways before proceeding to make a left-turn, right-turn, or straight. 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 Osage Trail carries approximately 21% of the entire vehicular traffic entering the intersection (Eldorado Drive carries 79% 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 limit on Eldorado Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of what may be expected for a four-lane major 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
ELDORADO DRIVE AT OSAGE TRAIL

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
No, average (293) vehicles per hour for highest 8 hours		**No, average (84) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 98% of required hourly traffic volume		**Meets 42% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*98% major street / 42% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approaches, as eastbound and westbound traffic on Osage Trail are required to stop, before making a left-turn or right-turn, or proceeding straight. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Eldorado Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Osage Trail at the intersection looking towards the oncoming lanes of cross-traffic on Eldorado Drive. 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 shown on Exhibits 3 and 4, a clear line of sight was achieved when looking from both side-street approaches.

EXHIBIT 3



Eastbound OSAGE TRAIL (*Looking North*) at ELDORADO DRIVE



Eastbound OSAGE TRAIL (*Looking South*) at ELDORADO DRIVE

EXHIBIT 4



Westbound OSAGE TRAIL (*Looking North*) at ELDORADO DRIVE



Westbound OSAGE TRAIL (*Looking South*) at ELDORADO DRIVE

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., Eldorado Drive). 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 most recent 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approaches was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a low activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Eldorado Drive at Osage Trail is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (4-way) stop sign installation is not recommended for the intersection of Eldorado Drive and Osage Trail. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF ELDORADO DRIVE AT OSAGE TRAIL
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.
82289748	20231224	1519	EL DORADO	OSAGE TRAIL	0		Y	A	3	A	3	22350	N	E	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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Eldorado Dr & Osage Trail

Day: Tuesday
Date: 1/28/2025

Highest 8 hours per Side-Street Perspective

City: Indian Wells
Project #: CA25_030002_022

DAILY TOTALS	NB	SB	EB	WB	Total
	1,657	1,855	457	487	4,456

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	7		2		0		0		9		12:00	29		40		16		10		95	
0:15	0		0		0		0		0		12:15	29		41		11		10		91	
0:30	0		0		0		0		0		12:30	23		31		10		16		80	
0:45	0	7	0	2	0		0		0	9	12:45	38	119	31	143	11	48	17	53	97	363
1:00	2		1		0		0		3		13:00	25		36		5		16		82	
1:15	1		0		0		0		1		13:15	48		35		10		8		101	
1:30	0		1		0		0		1		13:30	53		37		7		9		106	
1:45	0	3	0	2	0		0		0	5	13:45	47	173	26	134	8	30	7	40	88	377
2:00	0		0		0		1		1		14:00	53		43		6		16		118	
2:15	0		1		0		0		1		14:15	57		27		9		8		101	
2:30	0		0		0		0		0		14:30	73		35		8		10		126	
2:45	0		0	1	0		0	1	0	2	14:45	46	229	46	151	13	36	8	42	113	458
3:00	0		0		0		0		0		15:00	93		39		17		13		162	
3:15	0		0		0		0		0		15:15	55		19		7		6		87	
3:30	1		1		0		0		2		15:30	59		41		11		19		130	
3:45	1	2	1	2	0		0		2	4	15:45	52	259	36	135	12	47	5	43	105	484
4:00	0		2		0		0		2		16:00	45		21		10		14		90	
4:15	0		1		0		0		1		16:15	40		36		7		8		91	
4:30	0		1		0		0		1		16:30	37		37		12		9		95	
4:45	0		8	12	2	2	0		10	14	16:45	32	154	31	125	6	35	8	39	77	353
5:00	1		3		0		2		6		17:00	38		20		12		6		76	
5:15	1		5		1		1		8		17:15	36		15		15		6		72	
5:30	1		12		2		0		15		17:30	22		15		7		8		52	
5:45	3	6	23	43	1	4	1	4	28	57	17:45	22	118	20	70	9	43	9	29	60	260
6:00	1		7		0		4		12		18:00	9		12		0		3		24	
6:15	5		9		1		2		17		18:15	11		9		4		4		28	
6:30	5		19		3		2		29		18:30	9		9		2		1		21	
6:45	4	15	43	78	2	6	1	9	50	108	18:45	3	32	14	44	0	6	3	11	20	93
7:00	12		27		6		12		57		19:00	6		5		1		1		13	
7:15	11		41		4		5		61		19:15	3		2		1		0		6	
7:30	8		36		5		11		60		19:30	5		5		0		0		10	
7:45	20	51	51	155	7	22	14	42	92	270	19:45	4	18	10	22	4	6	1	2	19	48
8:00	25		60		9		10		104		20:00	6		14		1		1		22	
8:15	30		47		7		18		102		20:15	4		6		4		0		14	
8:30	25		55		9		11		100		20:30	8		7		0		1		16	
8:45	23	103	44	206	5	30	10	49	82	388	20:45	5	23	10	37	3	8	1	3	19	71
9:00	22		32		10		5		69		21:00	5		4		0		0		9	
9:15	16		37		6		7		66		21:15	8		7		0		0		15	
9:30	21		32		11		7		71		21:30	8		6		0		0		14	
9:45	29	88	38	139	7	34	17	36	91	297	21:45	3	24	3	20	0		0		6	44
10:00	31		35		12		7		85		22:00	2		1		0		1		4	
10:15	33		47		14		8		102		22:15	5		3		1		0		9	
10:30	36		38		11		10		95		22:30	2		2		0		0		4	
10:45	18	118	33	153	8	45	10	35	69	351	22:45	0	9	2	8	0	1	1	2	3	20
11:00	26		37		7		11		81		23:00	5		8		1		1		15	
11:15	23		39		16		16		94		23:15	4		3		0		0		7	
11:30	20		38		12		11		81		23:30	0		0		0		0		0	
11:45	28	97	47	161	18	53	8	46	101	357	23:45	0	9	1	12	0	1	0	1	1	23
TOTALS		490		954		196		222		1862	TOTALS		1167		901		261		265		2594
SPLIT %		26.3%		51.2%		10.5%		11.9%		41.8%	SPLIT %		45.0%		34.7%		10.1%		10.2%		58.2%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,657	1,855	457	487	4,456

AM Peak Hour	9:45	7:45	11:15	7:30	7:45	PM Peak Hour	14:15	14:00	12:00	12:15	14:15
AM Pk Volume	129	213	62	53	398	PM Pk Volume	269	151	48	59	502
Pk Hr Factor	0.896	0.888	0.861	0.736	0.957	Pk Hr Factor	0.723	0.821	0.750	0.868	0.775
7 - 9 Volume	154	361	52	91	658	4 - 6 Volume	272	195	78	68	613
7 - 9 Peak Hour	8:00	7:45	7:45	7:30	7:45	4 - 6 Peak Hour	16:00	16:00	16:30	16:00	16:00
7 - 9 Pk Volume	103	213	32	53	398	4 - 6 Pk Volume	154	125	45	39	353
Pk Hr Factor	0.858	0.888	0.889	0.736	0.957	Pk Hr Factor	0.856	0.845	0.750	0.696	0.929

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

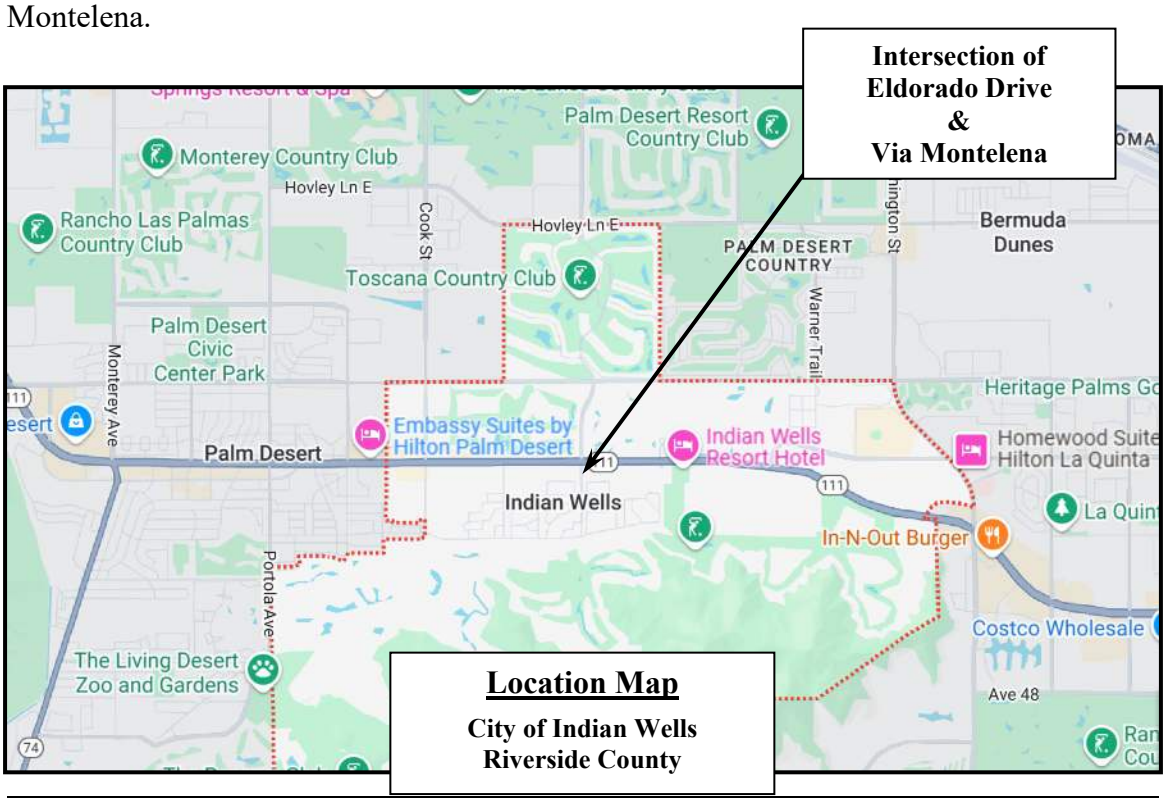
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF ELDORADO DRIVE AND VIA MONTELENA
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 11, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Eldorado Drive and Via Montelena. This analysis was completed in order to verify if a four-way stop sign installation is warranted and recommended based on meeting standard guidelines.

The location is a 4-way intersection with Eldorado Drive running in the north-south directions and Via Montelena in the east-west directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a two-way STOP sign control installed on Via Montelena.



Location Map
City of Indian Wells
Riverside County

BACKGROUND

In this segment, **Eldorado Drive** is classified as a north-south major collector roadway with primarily single-family residential properties on both sides of the street. At the subject intersection, the roadway is approximately 86 feet wide. The 4-lane roadway provides for two lanes of traffic and a bicycle lane in each direction, separated by a raised, concrete, landscaped center median. There are no marked crosswalks across Eldorado Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Eldorado Drive has a posted speed limit of 35 MPH, on-street parking is prohibited on both sides of the street via No Parking Any Time posted signs, and there is a No Trucks sign posted near Highway 111. Currently, there are no STOP signs or other types of traffic control on Eldorado Drive (i.e., uncontrolled) at its intersection with Via Montelena.

See Exhibit 1 (next page) for photo images of Eldorado Drive.

Via Montelena is classified as an east-west local private, gated roadway with single-family residential properties on both sides of the street. The roadway is approximately 32 feet wide east of Eldorado Drive. At the intersection, the roadway widens out to approximately 107 feet with a large raised center landscaped median at each entry. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Via Montelena. The roadway has curb and gutter improvements on both sides of the street. Via Montelena has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there are no STOP signs, painted STOP markings, or limit lines installed on Via Montelena at its intersection with Eldorado Drive.

See Exhibit 2 (following page) for photo images of Via Montelena.

EXHIBIT 1



ELDORADO DRIVE (*Looking Northbound*) at VIA MONTELENA



ELDORADO DRIVE (*Looking Southbound*) at VIA MONTELENA

EXHIBIT 2



VIA MONTELENA (*Looking Eastbound*) at ELDORADO DRIVE



VIA MONTELENA (*Looking Westbound*) at ELDORADO DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 4-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Eldorado Drive at Via Montelena		*None reported*		*None reported*		*None reported*	03/12/24	Sideswipe / No

Notes: Information above is derived per the latest 5-year intersection 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, there has been one (1) reported 'non-correctible' collision 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Eldorado Drive is 4,352 vehicles per day with the highest AM peak-hour volume having 380 vehicles, and 476 vehicles in the PM peak-hour. The bi-directional ADT count for Via Montelena is 366 vehicles with the highest AM peak-hour volume having 37 vehicles, and 40 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Eldorado Drive	Northbound	2,238	51%	320 (3 - 4 PM)
	Southbound	2,114	49%	219 (8 - 9 AM)
Via Montelena	Eastbound	168	46%	16 (8 - 9 AM)
	Westbound	198	64%	24 (2 - 3 PM)

Eldorado Drive is considered the 'through' or 'major' street at this residential 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, Via Montelena is considered the 'minor' street as drivers on Via Montelena should stop at Eldorado Drive and look both ways before proceeding to make a left-turn, right-turn, or straight. 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 Via Montelena carries approximately 8% of the entire vehicular traffic entering the intersection (Eldorado Drive carries 92% 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 limit on Eldorado Drive is 35 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of what may be expected for a four-lane major 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
ELDORADO DRIVE AT VIA MONTELENA

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
Yes, average (366) vehicles per hour for highest 8 hours		**No, average (31) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 100% of required hourly traffic volume		**Meets 16% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*100% major street / 16% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approaches, as eastbound and westbound traffic on Via Montelena are required to stop, before making a left-turn or right-turn, or proceeding straight. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(see Appendix D)***. In this reference, a 35 MPH roadway speed recommends a minimum Stopping Sight Distance of 250 feet. However, it is likely that the 85th percentile speeds typically exceed the 35 MPH posted speed limit. Therefore, a 40 MPH speed limit was used as a more conservative measure, which has a minimum sight distance of 305 feet.

This 305-foot distance was used when looking towards approaching, uncontrolled traffic along Eldorado Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Via Montelena at the intersection looking towards the oncoming lanes of cross-traffic on Eldorado Drive. 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 shown on Exhibits 3 and 4, a clear line of sight was achieved when looking from both side-street approaches.

EXHIBIT 3



Eastbound VIA MONTELENA (*Looking North*) at ELDORADO DRIVE



Eastbound VIA MONTELENA (*Looking South*) at ELDORADO DRIVE

EXHIBIT 4



Westbound VIA MONTELENA (*Looking North*) at ELDORADO DRIVE



Westbound OSAGE TRAIL (*Looking South*) at ELDORADO DRIVE

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., Eldorado Drive). 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 most recent 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approaches was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 305 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a low activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Eldorado Drive at Via Montelena is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (4-way) stop sign installation is not recommended for the intersection of Eldorado Drive and Via Montelena.

Since there are no STOP signs installed on the minor street, in order to better assign right-of-way at this intersection, it is recommended to post two (2) STOP signs facing the Via Montelena approaches to the intersection (i.e., 2-Way Stop control). If the City approves this recommendation, the cost for this installation is in the approximate range of $500.00 to $800.00.

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 INDIAN WELLS
INTERSECTION OF ELDORADO DRIVE AT VIA MONTELENA/CAMINO CIELO
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.
82360466	20240312	1300	ELDORADO DR	HWY 111	387	S	N	A	0	A	8	22107	M	B	C	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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Eldorado Dr & Cam Cielo/Via Brisa/Via Montelena

Day: Tuesday
Date: 1/28/2025

Highest 8 hours per Side-Street Perspective

City: Indian Wells
Project #: CA25_030002_023

DAILY TOTALS	NB	SB	EB	WB	Total
	2,238	2,114	168	198	4,718

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00	7		2		0		0		9		12:00	42		43		5		4		94	
0:15	0		0		0		0		0		12:15	38		49		3		8		98	
0:30	0		0		0		0		0		12:30	42		36		4		3		85	
0:45	0	7	0	2	0		0		0	9	12:45	50	172	37	165	2	14	4	19	93	370
1:00	2		1		0		0		3		13:00	40		37		6		2		85	
1:15	1		0		0		0		1		13:15	54		46		4		4		108	
1:30	0		1		0		0		1		13:30	62		41		3		6		112	
1:45	0	3	0	2	0		0		0	5	13:45	54	210	30	154	1	14	4	16	89	394
2:00	1		0		0		0		1		14:00	67		49		4		3		123	
2:15	0		1		0		0		1		14:15	66		31		3		4		104	
2:30	0		0		0		0		0		14:30	82		38		3		5		128	
2:45	0	1	0	1	0		0		0	2	14:45	61	276	55	173	6	16	12	24	134	489
3:00	0		0		0		0		0		15:00	114		46		4		3		167	
3:15	0		0		0		0		0		15:15	63		25		1		6		95	
3:30	1		1		0		0		2		15:30	82		44		2		4		132	
3:45	1	2	2	3	0		0		3	5	15:45	61	320	41	156	4	11	4	17	110	504
4:00	0		1		1		1		3		16:00	62		30		2		0		94	
4:15	0		1		0		0		1		16:15	51		45		8		1		105	
4:30	0		1		0		0		1		16:30	51		41		2		4		98	
4:45	2	2	8	11	0	1	0	1	10	15	16:45	38	202	38	154	2	14	5	10	83	380
5:00	3		3		0		0		6		17:00	52		21		3		3		79	
5:15	2		6		0		1		9		17:15	44		21		1		5		71	
5:30	3		12		0		1		16		17:30	34		20		1		2		57	
5:45	5	13	23	44	3	3	0	2	31	62	17:45	37	167	24	86	2	7	3	13	66	273
6:00	5		8		0		1		14		18:00	11		20		2		3		36	
6:15	7		9		1		1		18		18:15	17		12		3		2		34	
6:30	7		20		0		0		27		18:30	12		11		2		3		28	
6:45	6	25	47	84	2	3	1	3	56	115	18:45	5	45	21	64	1	8	1	9	28	126
7:00	27		31		0		2		60		19:00	8		6		1		1		16	
7:15	13		46		3		3		65		19:15	4		5		3		0		12	
7:30	20		39		2		6		67		19:30	5		5		0		0		10	
7:45	29	89	53	169	6	11	7	18	95	287	19:45	7	24	9	25	4	8	0	1	20	58
8:00	38		64		3		7		112		20:00	7		17		0		0		24	
8:15	46		49		6		5		106		20:15	8		10		1		0		19	
8:30	40		54		1		8		103		20:30	9		8		1		0		18	
8:45	37	161	52	219	6	16	1	21	96	417	20:45	9	33	11	46	0	2	0		20	81
9:00	26		34		2		0		62		21:00	4		6		2		1		13	
9:15	24		39		2		6		71		21:15	7		7		1		0		15	
9:30	33		35		1		8		77		21:30	7		6		0		0		13	
9:45	44	127	44	152	1	6	5	19	94	304	21:45	3	21	5	24	0	3	0	1	8	49
10:00	43		42		5		2		92		22:00	3		4		0		1		8	
10:15	46		51		1		2		100		22:15	6		3		0		0		9	
10:30	42		42		6		2		92		22:30	2		3		0		0		5	
10:45	29	160	35	170	3	15	6	12	73	357	22:45	1	12	5	15	0		0	1	6	28
11:00	36		47		2		1		86		23:00	7		8		0		1		16	
11:15	46		44		3		2		95		23:15	4		3		0		0		7	
11:30	31		41		4		4		80		23:30	0		1		0		0		1	
11:45	42	155	49	181	7	16	3	10	101	362	23:45	0	11	2	14	0		0	1	2	26
TOTALS		745		1038		71		86		**1940**	**TOTALS**		1493		1076		97		112		**2778**
SPLIT %		38.4%		53.5%		3.7%		4.4%		**41.1%**	**SPLIT %**		53.7%		38.7%		3.5%		4.0%		**58.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	2,238	2,114	168	198	4,718

AM Peak Hour	9:45	7:45	11:15	7:45	**8:00**	**PM Peak Hour**	14:15	14:00	12:30	14:30	**14:15**
AM Pk Volume	175	220	19	27	**417**	**PM Pk Volume**	323	173	16	26	**533**
Pk Hr Factor	0.951	0.859	0.679	0.844	**0.931**	**Pk Hr Factor**	0.708	0.786	0.667	0.542	**0.798**
7 - 9 Volume	250	388	27	39	**704**	**4 - 6 Volume**	369	240	21	23	**653**
7 - 9 Peak Hour	8:00	7:45	7:30	7:45	**8:00**	**4 - 6 Peak Hour**	16:00	16:00	16:15	16:30	**16:00**
7 - 9 Pk Volume	161	220	17	27	**417**	**4 - 6 Pk Volume**	202	154	15	17	**380**
Pk Hr Factor	0.875	0.859	0.708	0.844	**0.931**	**Pk Hr Factor**	0.815	0.856	0.469	0.850	**0.905**

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

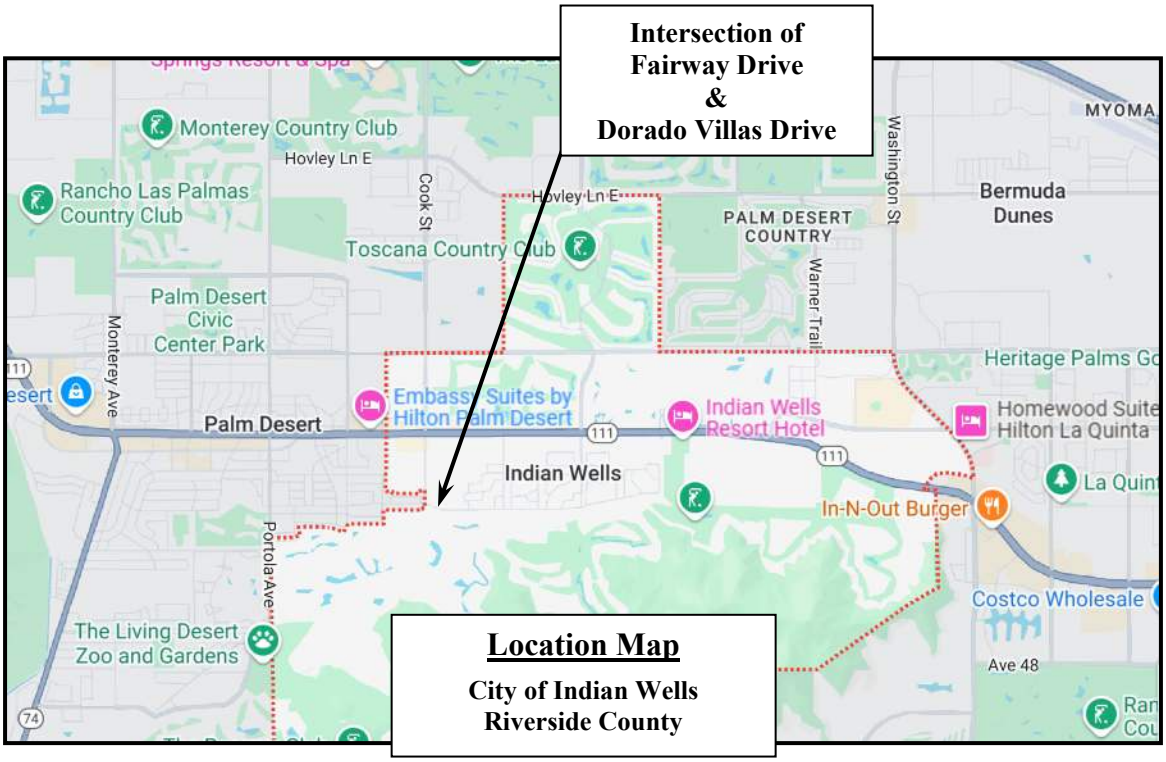
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND DORADO VILLAS DRIVE
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 12, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Dorado Villas Drive. 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 3-way intersection with Fairway Drive running in the east-west directions and Dorado Villas Drive in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Dorado Villas Drive.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 50 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is prohibited on both sides of the street via No Parking Any Time posted signs, and there is a No Trucks sign posted near Cook Street. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Dorado Villas Drive.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Dorado Villas Drive is classified as a north-south private local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Dorado Villas Drive, the roadway widens out to approximately 94 feet, which includes a raised center landscape median. However, the roadway width at the gate is approximately 60 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Dorado Villas Drive. The roadway has curb and gutter improvements on both sides of the street. Dorado Villas Drive has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way posted STOP sign on Dorado Villas Drive at its intersection with Fairway Drive, which does not include a STOP pavement marking or a limit line.

See Exhibit 2 (following page) for a photo image of Dorado Villas Drive.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at DORADO VILLAS DRIVE



FAIRWAY DRIVE (*Looking Westbound*) at DORADO VILLAS DRIVE

EXHIBIT 2



DORADO VILLAS DRIVE (*Looking Southbound*) at FAIRWAY DRIVE



DORADO VILLAS DRIVE (*Looking from Opposite Side)*

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Dr at Dorado Villas Drive		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,716 vehicles per day with the highest AM peak-hour volume having 317 vehicles, and 412 vehicles in the PM peak-hour. The bi-directional ADT count for Dorado Villas is 253 vehicles with the highest AM peak-hour volume having 33 vehicles, and 26 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	2,070	56%	242 (3 - 4 PM)
	Westbound	1,646	44%	200 (2 - 3 PM)
Dorado Villas				
	Southbound	253	100%	33 (11 AM - 12 PM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Dorado Villas Drive is considered the 'minor' street as drivers on Dorado Villas Drive are required to stop at Fairway Drive 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 Dorado Villas Drive carries approximately 6% of the entire vehicular traffic entering the intersection (Fairway Drive carries 94% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT DORADO VILLAS DRIVE

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
Yes, average (326) vehicles per hour for highest 8 hours		**No, average (24) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 100% of required hourly traffic volume		**Meets 12% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*100% major street / 12% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as southbound traffic on Dorado Villas Drive is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Dorado Villas Drive at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound DORADO VILLAS DRIVE (*Looking East*) at FAIRWAY DRIVE



Southbound DORADO VILLAS DRIVE (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Dorado Villas Drive is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Dorado Villas Drive. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT DORADO VILLAS DRIVE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Dorado Villas Dr (*Cahilla Dr per Google Earth*) & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	253	2,070	1,646	3,969

AM Period	NB		SB		EB		WB		TOTAL	
0:00			0		1		2		3	
0:15			0		0		0		0	
0:30			0		1		0		1	
0:45			0		1	3	1	3	2	6
1:00			0		0		0		0	
1:15			0		0		0		0	
1:30			0		0		0		0	
1:45			0		1	1	0		1	1
2:00			0		0		0		0	
2:15			0		0		0		0	
2:30			0		1		0		1	
2:45		1	1	1	2	1	1	3	4	
3:00			0		0		0		0	
3:15			0		0		0		0	
3:30			0		0		0		0	
3:45			0		1	1	1	1	2	2
4:00			0		1		0		1	
4:15			0		1		0		1	
4:30			0		0		2		2	
4:45		1	1	1	3	0	2	2	6	
5:00			0		1		3		4	
5:15			0		2		0		2	
5:30			1		3		1		5	
5:45		0	1	3	9	1	5	4	15	
6:00			1		4		2		7	
6:15			0		8		5		13	
6:30			1		5		6		12	
6:45		0	2	18	35	7	20	25	57	
7:00			0		16		15		31	
7:15			3		17		14		34	
7:30			2		27		30		59	
7:45		5	10	36	96	41	100	82	206	
8:00			8		39		39		86	
8:15			4		42		28		74	
8:30			3		40		24		67	
8:45		4	19	42	163	55	146	101	328	
9:00			4		34		20		58	
9:15			5		25		39		69	
9:30			10		30		31		71	
9:45		10	29	37	126	31	121	78	276	
10:00			5		34		29		68	
10:15			3		38		38		79	
10:30			7		35		24		66	
10:45		8	23	49	156	42	133	99	312	
11:00			7		54		36		97	
11:15			9		57		41		107	
11:30			9		44		26		79	
11:45		8	33	32	187	27	130	67	350	
TOTALS			119		782		662		1563	
SPLIT %			7.6%		50.0%		42.4%		39.4%	

PM Period	NB		SB		EB		WB		TOTAL	
12:00			3		43		40		86	
12:15			4		27		24		55	
12:30			3		35		24		62	
12:45			2	12	34	139	45	133	81	284
13:00			2		44		47		93	
13:15			6		35		36		77	
13:30			7		52		31		90	
13:45			5	20	40	171	57	171	102	362
14:00			7		48		38		93	
14:15			8		50		50		108	
14:30			3		48		53		104	
14:45			4	22	60	206	59	200	123	428
15:00			5		75		58		138	
15:15			8		57		46		111	
15:30			8		54		31		93	
15:45			5	26	56	242	35	170	96	438
16:00			2		48		21		71	
16:15			5		53		35		93	
16:30			5		50		26		81	
16:45			7	19	31	182	21	103	59	304
17:00			6		46		21		73	
17:15			4		41		26		71	
17:30			6		38		20		64	
17:45			3	19	25	150	16	83	44	252
18:00			2		11		16		29	
18:15			1		18		15		34	
18:30			2		5		7		14	
18:45			3	8	18	52	11	49	32	109
19:00			0		12		4		16	
19:15			3		9		4		16	
19:30			1		11		2		14	
19:45			0	4	12	44	4	14	16	62
20:00			0		9		5		14	
20:15			0		14		5		19	
20:30			0		11		7		18	
20:45			0		13	47	4	21	17	68
21:00			1		11		7		19	
21:15			0		10		2		12	
21:30			0		7		7		14	
21:45			0	1	1	29	5	21	6	51
22:00			0		1		4		5	
22:15			0		3		5		8	
22:30			0		7		0		7	
22:45			2	2	5	16	1	10	8	28
23:00			0		6		4		10	
23:15			1		2		3		6	
23:30			0		1		1		2	
23:45			0	1	1	10	1	9	2	20
TOTALS			134		1288		984		2406	
SPLIT %			5.6%		53.5%		40.9%		60.6%	

DAILY TOTALS	NB	SB	EB	WB	Total
	0	253	2,070	1,646	3,969

AM Peak Hour		10:45	10:45	8:00	10:45	PM Peak Hour	13:30	14:45	14:15	14:30
AM Pk Volume		33	204	146	382	PM Pk Volume	27	246	220	476
Pk Hr Factor		0.917	0.895	0.664	0.893	Pk Hr Factor	0.844	0.820	0.932	0.862
7 - 9 Volume	0	29	259	246	534	4 - 6 Volume	0	38	332	186	556
7 - 9 Peak Hour		7:45	8:00	8:00	8:00	4 - 6 Peak Hour		16:15	16:00	16:00	16:15
7 - 9 Pk Volume	0	20	163	146	328	4 - 6 Pk Volume	0	23	182	103	306
Pk Hr Factor	0.000	0.625	0.970	0.664	0.812	Pk Hr Factor	0.000	0.821	0.858	0.736	0.823

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

HARTZOG & CRABILL, Inc.

Gerald J. Stock, PE, TE,
Executive Vice President

17821 E. 17th Street
Suite 245
Tustin, CA 92780

Phone: (714) 731-9455
FAX: (714) 731-9498

www.hartzog-crabill.com

April 16, 2025

Mr. Ken Seumalo, P.E.
Public Works Director
City of Indian Wells
44-950 Eldorado Drive
Indian Wells, CA 92210

Subject: Letter of Opinion Regarding Proposed Sidewalk Improvements on Fairway Drive Between Cook Street and Eldorado Drive

Dear Mr. Seumalo:

Hartzog & Crabill, Inc. (HCI) understands that the City of Indian Wells proposes to install approximately one (1) mile of sidewalk improvements on Fairway Drive, from Cook Street to Eldorado Drive. To limit the impacts to the residential homes on the north side of Fairway Drive, it is our understanding that the new sidewalks will only be installed on the south side of the street between Dorado Villas Drive and Eldorado Drive. However, due to right-of-way (ROW) constraints on the south side of Fairway Drive near Cook Street, the City is considering the following two (2) alternatives as described below and shown in the attached Exhibits:

- Alternative A – Between Cook Street and Dorado Villas Drive, construct sidewalk on the north side of Fairway Drive and connect the two (2) sidewalks with an uncontrolled marked crosswalk at Dorado Villas Drive.

- Alternative B – Reduce the curb-to-curb road width on Fairway Drive near Cook Street from 50 feet to 40 feet to construct the sidewalk on the south side of the street within the existing ROW.

Based on our review of the two (2) alternatives, it is recommended that the City proceed with Alternative B, if determined feasible, to construct the sidewalk on the south side Fairway Drive. This alternative would encourage pedestrians to cross Fairway Drive at Cook Street, which is controlled by Stop signs. It would also create uniformity for the project to have the sidewalk on the south side of Fairway Drive for the entire length.

If Alternative B is determined infeasible during the preparation of the construction plans, then proceed with Alternative A. The following

Alternative A improvements are recommended with the installation of the marked crosswalk on Fairway Drive at Dorado Villas Drive:

- Install high visibility marked crosswalk.
- Install fluorescent yellow Pedestrian Crossing warning signs (W11-2 and W16-7P).
- Install Rectangular Rapid Flashing Beacons (RRFB) system with actuated pedestrian push buttons.
- In advance of marked crosswalk, install Yield Here to Pedestrians sign (R1-5) and Yield line.
- In advance of marked crosswalk, install fluorescent yellow Pedestrian Crossing Ahead warning signs (W11-2) and PED XING pavement markings.

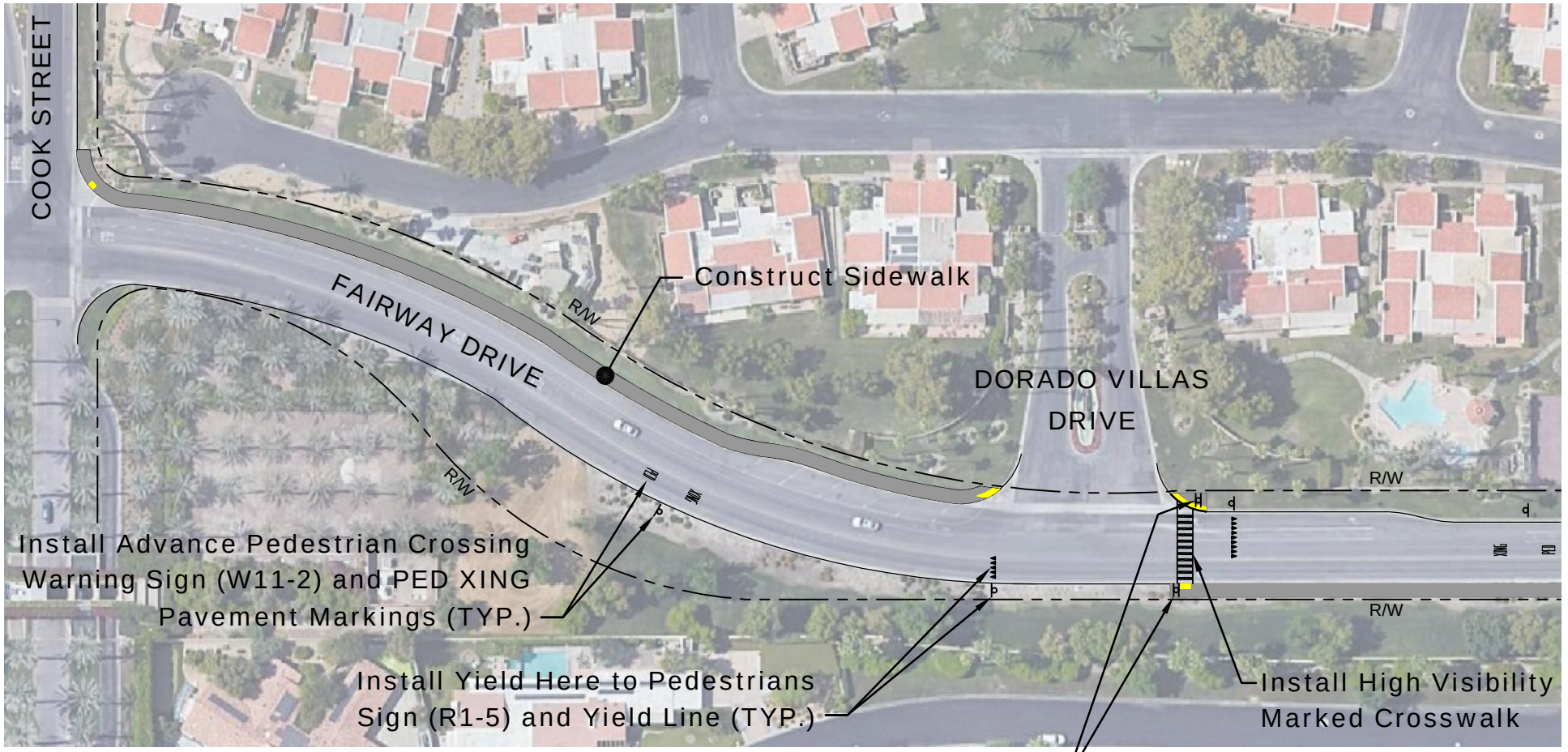
We look forward to your acceptance of our recommendations, and to any additional services the City of Indian Wells may request. If you may have any questions or need further information, please feel free to call our office at (714) 731-9455. Thank you again for the opportunity to serve your community.

Sincerely,
Hartzog & Crabill, Inc.

Scott Ma

Scott Ma, P.E., T.E.
Senior Engineer

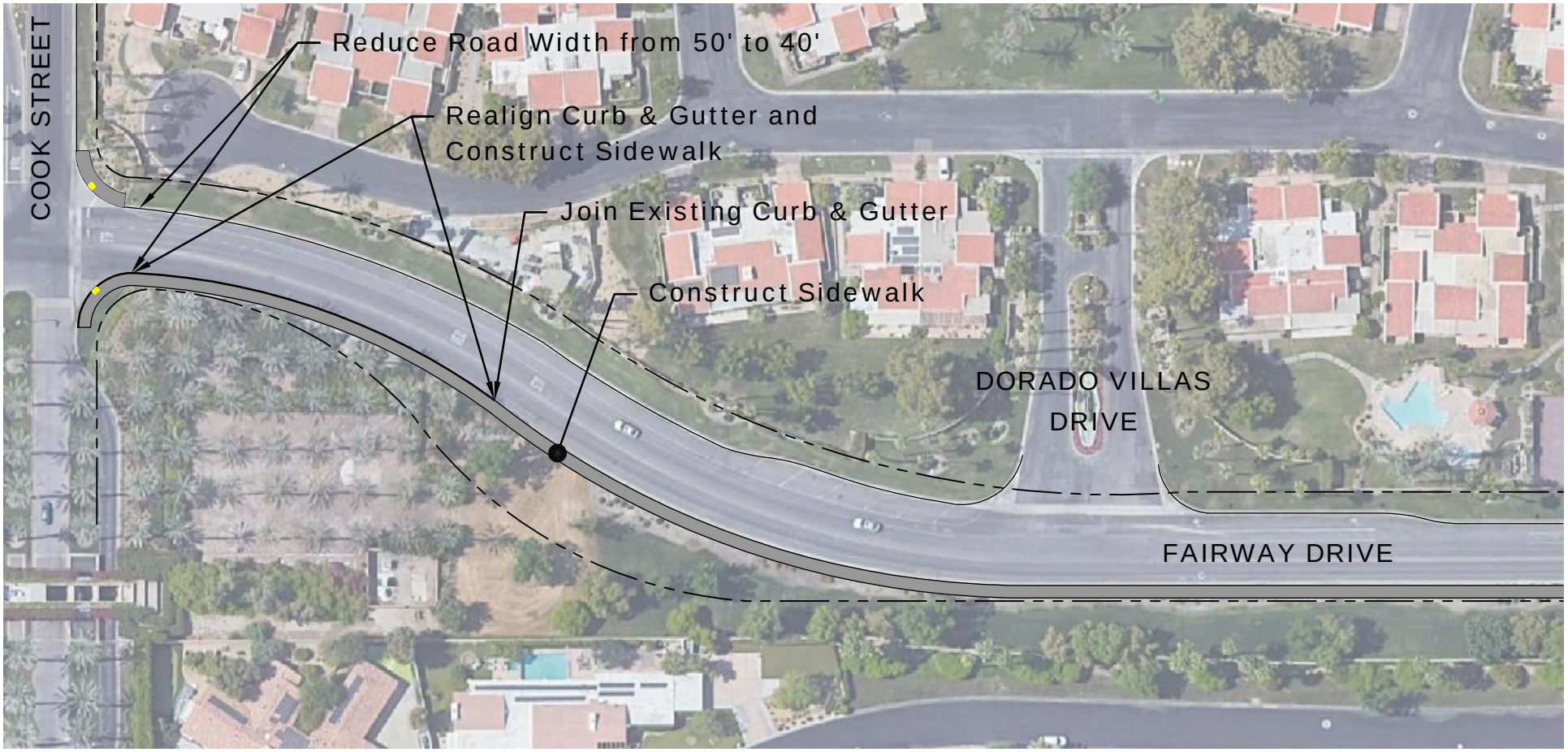
Attachments – (2) Alternative Exhibits



Alternative A

Fairway Drive Between Cook Street and Dorado Villas Drive

CITY OF INDIAN WELLS



Alternative B

Fairway Drive Between Cook Street and Dorado Villas Drive

CITY OF INDIAN WELLS

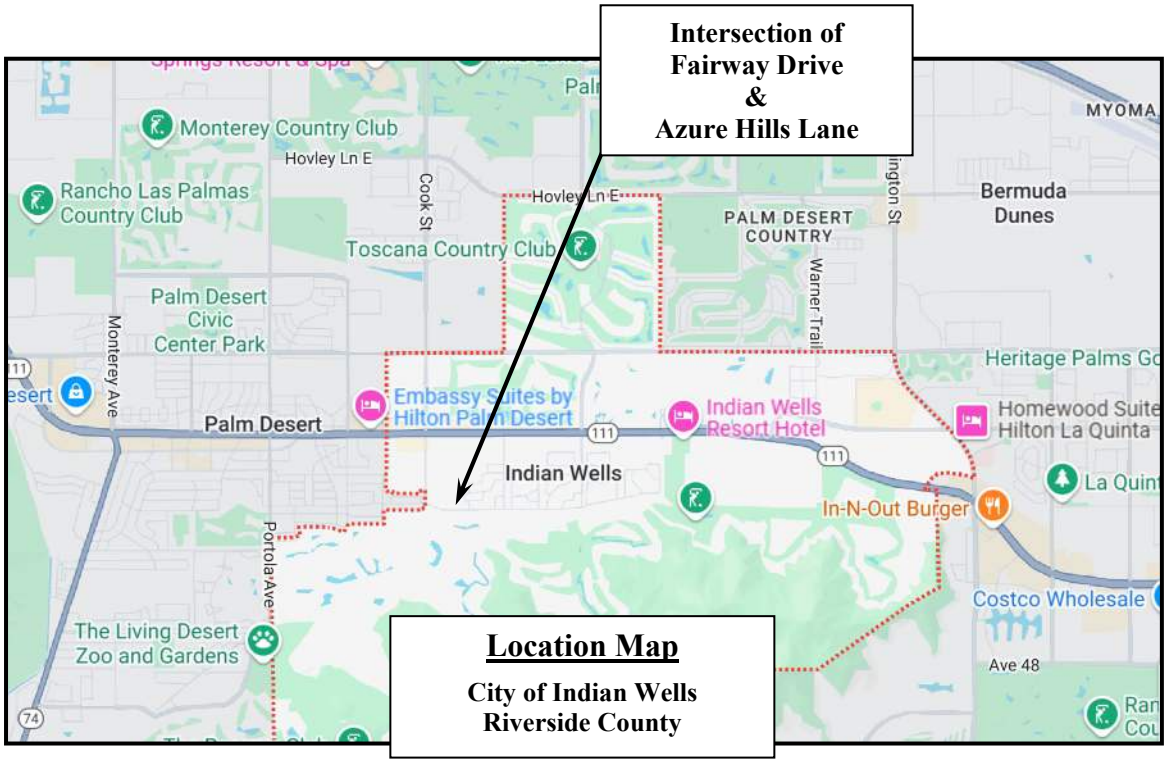
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND AZURE HILLS LANE
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 13, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Azure Hills Lane. 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 3-way intersection with Fairway Drive running in the east-west directions and Azure Hills Lane in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Azure Hills Lane.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 40 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. There is a No Trucks sign posted near Cook Street. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Azure Hills Lane.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Azure Hills Lane is classified as a north-south local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Azure Hills Lane, the roadway is approximately 36 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Azure Hills Lane. The roadway has curb and gutter improvements on both sides of the street. Azure Hills Lane has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way STOP sign installation posted on Azure Hills Lane at its intersection with Fairway Drive.

See Exhibit 2 (following page) for a photo image of Azure Hills Lane.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at AZURE HILLS LANE



FAIRWAY DRIVE (*Looking Westbound*) at AZURE HILLS LANE

EXHIBIT 2



AZURE HILLS LANE (*Looking Southbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Drive at Azure Hills Ln		*None reported*		*None reported*	11/10/23	Broadside / Yes		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there has been one (1) reported collision 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,549 vehicles per day with the highest AM peak-hour volume having 305 vehicles, and 405 vehicles in the PM peak-hour. The bi-directional ADT count for Azure Hills Lane is 122 vehicles with the highest AM peak-hour volume having 12 vehicles, and 13 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	2,001	56%	241 (3 - 4 PM)
	Westbound	1,548	44%	188 (2 - 3 PM)
Azure Hills Lane				
	Southbound	122	100%	13 (2 - 3 PM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Azure Hills Lane is considered the 'minor' street as drivers on Azure Hills Lane are required to stop at Fairway Drive 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 Azure Hills Lane carries approximately 3% of the entire vehicular traffic entering the intersection (Fairway Drive carries 97% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT AZURE HILLS LANE

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
Yes, average (305) vehicles per hour for highest 8 hours		**No, average (11) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 100% of required hourly traffic volume		**Meets 6% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*100% major street / 6% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as southbound traffic on Azure Hills Lane is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Azure Hills Lane at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound AZURE HILLS LANE (*Looking East*) at FAIRWAY DRIVE



Southbound AZURE HILLS LANE (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in one (1) SWITRS-reported 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Azure Hills Lane is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Azure Hills Lane. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT AZURE HILLS LANE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.
82242346	20231110	1344	FAIRWAY DR	AZURE HILLS LN	10	S	N	A	4	A	5	21651	N	D	C	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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Azure Hills Ln & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_004

DAILY TOTALS	NB	SB	EB	WB	Total
	0	122	2,001	1,548	3,671

AM Period	NB		SB		EB		WB		TOTAL	
0:00			0		1		2		3	
0:15			0		0		0		0	
0:30			0		1		0		1	
0:45			0		0	2	1	3	1	5
1:00			0		1		0		1	
1:15			0		0		0		0	
1:30			0		0		0		0	
1:45			0		1	2	0		1	2
2:00			0		0		0		0	
2:15			0		0		0		0	
2:30			0		0		0		0	
2:45			0		1	1	1	1	2	2
3:00			0		0		0		0	
3:15			0		0		0		0	
3:30			1		0		0		1	
3:45		1	0		1	1	1	1	2	3
4:00			0		1		0		1	
4:15			0		1		0		1	
4:30			0		0		2		2	
4:45			0		1	3	0	2	1	5
5:00			1		1		2		4	
5:15			0		3		0		3	
5:30			0		4		1		5	
5:45		1	0		2	10	1	4	3	15
6:00			0		3		2		5	
6:15			1		8		4		13	
6:30			1		4		5		10	
6:45		2	0		18	33	7	18	25	53
7:00			0		16		15		31	
7:15			1		17		13		31	
7:30			2		29		30		61	
7:45		11	8	96	34	93	35	136	77	200
8:00			1		42		39		82	
8:15			2		42		25		69	
8:30			0		40		23		63	
8:45		10	7	169	45	133	49	115	101	257
9:00			1		37		20		58	
9:15			2		24		38		64	
9:30			3		32		28		63	
9:45		9	3	133	40	158	29	120	72	290
10:00			3		37		26		66	
10:15			3		38		34		75	
10:30			1		38		23		62	
10:45		12	5	179	45	123	37	123	87	312
11:00			4		51		33		88	
11:15			4		56		38		98	
11:30			0		41		26		67	
11:45		10	2	179	31	123	26	123	59	312
TOTALS			56		787		616			**1459**
SPLIT %			3.8%		53.9%		42.2%			**39.7%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00			3		41		37		81	
12:15			2		24		22		48	
12:30			1		24		23		48	
12:45		9	3	118	29	124	42	124	74	251
13:00			5		39		42		86	
13:15			2		36		34		72	
13:30			0		48		32		80	
13:45		12	5	162	39	160	52	160	96	334
14:00			3		46		36		85	
14:15			2		53		48		103	
14:30			3		48		50		101	
14:45		13	5	200	53	188	54	188	112	401
15:00			3		78		57		138	
15:15			1		57		46		104	
15:30			3		52		28		83	
15:45		10	3	241	54	164	33	164	90	415
16:00			1		46		20		67	
16:15			2		51		35		88	
16:30			3		45		23		71	
16:45		7	1	173	31	99	21	99	53	279
17:00			2		45		22		69	
17:15			1		38		24		63	
17:30			2		36		18		56	
17:45		9	4	145	26	78	14	78	44	232
18:00			0		9		16		25	
18:15			0		16		15		31	
18:30			2		5		5		12	
18:45		3	1	47	17	46	10	46	28	96
19:00			0		9		4		13	
19:15			1		7		3		11	
19:30			1		10		2		13	
19:45		2	0	38	12	13	4	13	16	53
20:00			0		7		5		12	
20:15			0		10		5		15	
20:30			1		11		6		18	
20:45		1	0	40	12	20	4	20	16	61
21:00			0		10		7		17	
21:15			0		9		2		11	
21:30			0		7		7		14	
21:45			0		1	27	5	21	6	48
22:00			0		1		4		5	
22:15			0		3		5		8	
22:30			0		4		0		4	
22:45			0		5	13	1	10	6	23
23:00			0		6		4		10	
23:15			0		3		3		6	
23:30			0		1		1		2	
23:45			0		0	10	1	9	1	19
TOTALS			66		1214		932			**2212**
SPLIT %			3.0%		54.9%		42.1%			**60.3%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	122	2,001	1,548	3,671

AM Peak Hour		10:30	10:45	8:00	**10:45**	**PM Peak Hour**		13:45	15:00	14:15	**14:30**
AM Pk Volume		14	193	136	**340**	**PM Pk Volume**		13	241	209	**455**
Pk Hr Factor		0.700	0.862	0.694	**0.867**	**Pk Hr Factor**		0.650	0.772	0.917	**0.824**
7 - 9 Volume	0	21	265	229	**515**	**4 - 6 Volume**	0	16	318	177	**511**
7 - 9 Peak Hour		7:30	8:00	8:00	**8:00**	**4 - 6 Peak Hour**		17:00	16:00	16:15	**16:15**
7 - 9 Pk Volume	0	13	169	136	**315**	**4 - 6 Pk Volume**	0	9	173	101	**281**
Pk Hr Factor	0.000	0.406	0.939	0.694	**0.780**	**Pk Hr Factor**	0.000	0.563	0.848	0.721	**0.798**

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

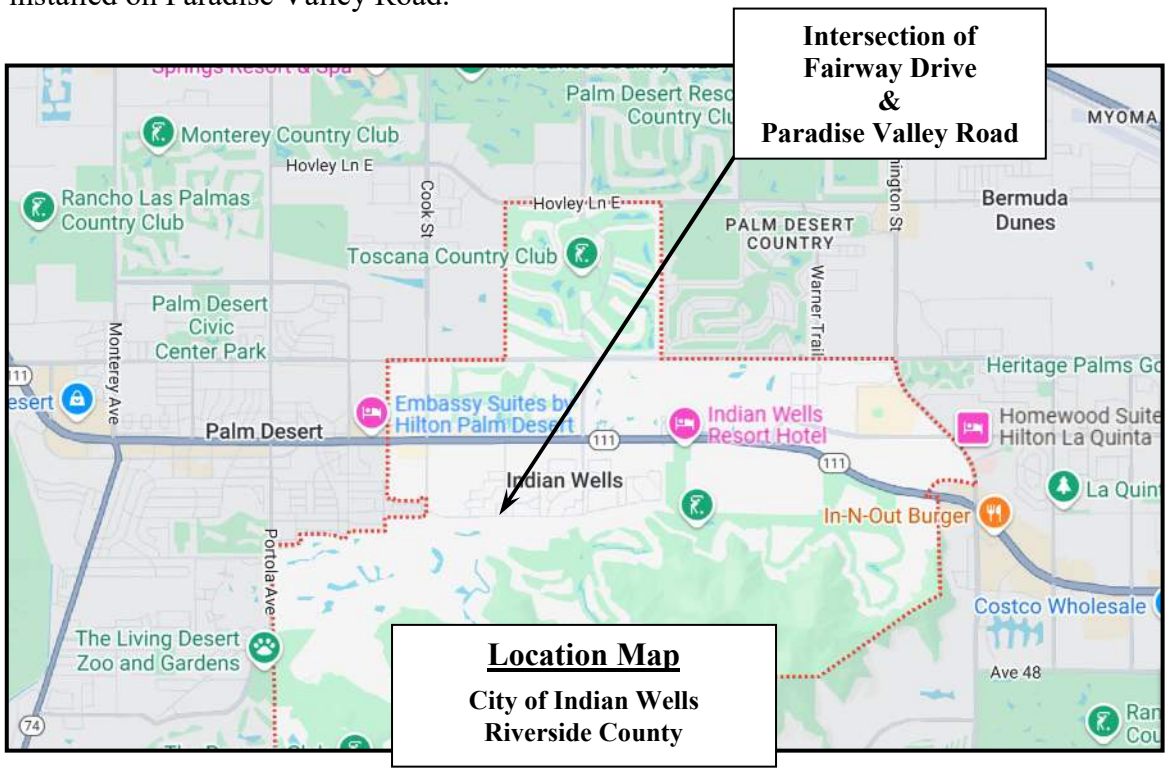
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND PARADISE VALLEY ROAD
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 14, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Paradise Valley Road. 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 3-way intersection with Fairway Drive running in the east-west directions and Paradise Valley Road in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Paradise Valley Road.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 40 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. There is a No Trucks sign posted near Cook Street. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Paradise Valley Road.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Paradise Valley Road is classified as a north-south local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Paradise Valley Road, the roadway is approximately 36 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Paradise Valley Road. The roadway has curb and gutter improvements on both sides of the street. Paradise Valley Road has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way STOP sign installation posted on Paradise Valley Road at its intersection with Fairway Drive.

See Exhibit 2 (following page) for a photo image of Paradise Valley Road.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at PARADISE VALLEY ROAD



FAIRWAY DRIVE (*Looking Westbound*) at PARADISE VALLEY ROAD

EXHIBIT 2



PARADISE VALLEY ROAD (*Looking Southbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Dr at Paradise Valley Road		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,418 vehicles per day with the highest AM peak-hour volume having 297 vehicles, and 376 vehicles in the PM peak-hour. The bi-directional ADT count for Paradise Valley Road is 39 vehicles with the highest AM peak-hour volume having 4 vehicles, and 5 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	1,901	56%	223 (3 - 4 PM)
	Westbound	1,517	44%	183 (2 - 3 PM)
Paradise Valley Road				
	Southbound	39	100%	5 (5 - 6 PM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Paradise Valley Road is considered the 'minor' street as drivers on Paradise Valley Road are required to stop at Fairway Drive 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 Paradise Valley Road carries approximately 1% of the entire vehicular traffic entering the intersection (Fairway Drive carries 99% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT PARADISE VALLEY ROAD

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
No, average (279) vehicles per hour for highest 8 hours		**No, average (4) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 93% of required hourly traffic volume		**Meets 2% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*93% major street / 2% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as southbound traffic on Paradise Valley Road is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Paradise Valley Road at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound PARADISE VALLEY ROAD (*Looking East*) at FAIRWAY DRIVE



Southbound PARADISE VALLEY ROAD (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Paradise Valley Road is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Paradise Valley Road. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT PARADISE VALLEY ROAD
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Paradise Valley Rd & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_007

DAILY TOTALS	NB	SB	EB	WB	Total
	0	39	1,901	1,517	3,457

AM Period	NB		SB		EB		WB		TOTAL	
0:00			0		0		2		2	
0:15			0		0		0		0	
0:30			0		0		0		0	
0:45			0		1	1	1	3	2	4
1:00			0		1		0		1	
1:15			0		0		0		0	
1:30			0		0		0		0	
1:45			0		1	2	0		1	2
2:00			0		0		0		0	
2:15			0		0		0		0	
2:30			0		0		0		0	
2:45			0		1	1	1	1	2	2
3:00			0		0		0		0	
3:15			0		0		0		0	
3:30			0		1		1		2	
3:45			0		1	2	1	2	2	4
4:00			0		1		0		1	
4:15			0		1		0		1	
4:30			0		0		2		2	
4:45			0		1	3	0	2	1	5
5:00			0		1		2		3	
5:15			0		3		0		3	
5:30			1		4		0		5	
5:45			0	1	2	10	1	3	3	14
6:00			0		5		3		8	
6:15			0		7		4		11	
6:30			1		4		5		10	
6:45			0	1	17	33	6	18	23	52
7:00			0		15		16		31	
7:15			0		17		13		30	
7:30			1		27		29		57	
7:45			0	1	35	94	34	92	69	187
8:00			0		41		39		80	
8:15			2		35		24		61	
8:30			1		38		23		62	
8:45			1	4	42	156	48	134	91	294
9:00			0		34		21		55	
9:15			2		22		35		59	
9:30			0		25		29		54	
9:45			1	3	38	119	31	116	70	238
10:00			1		35		28		64	
10:15			1		38		35		74	
10:30			0		33		21		54	
10:45			2	4	47	153	36	120	85	277
11:00			0		51		37		88	
11:15			2		56		35		93	
11:30			1		40		22		63	
11:45			0	3	29	176	27	121	56	300
TOTALS				17		750		612		**1379**
SPLIT %				1.2%		54.4%		44.4%		**39.9%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00			2		33		36		71	
12:15			0		24		19		43	
12:30			1		24		22		47	
12:45			0	3	24	105	43	120	67	228
13:00			1		36		40		77	
13:15			1		40		35		76	
13:30			2		43		31		76	
13:45			0	4	40	159	52	158	92	321
14:00			0		43		35		78	
14:15			0		51		47		98	
14:30			1		45		47		93	
14:45			0	1	50	189	54	183	104	373
15:00			2		69		56		127	
15:15			0		50		39		89	
15:30			1		50		25		76	
15:45			0	3	54	223	33	153	87	379
16:00			0		45		22		67	
16:15			0		50		35		85	
16:30			1		44		21		66	
16:45			0	1	29	168	20	98	49	267
17:00			1		43		23		67	
17:15			1		38		21		60	
17:30			1		31		17		49	
17:45			2	5	29	141	13	74	44	220
18:00			1		10		16		27	
18:15			0		15		15		30	
18:30			0		6		5		11	
18:45			1	2	16	47	10	46	27	95
19:00			0		8		4		12	
19:15			0		5		3		8	
19:30			0		10		2		12	
19:45			0		10	33	5	14	15	47
20:00			1		7		4		12	
20:15			1		9		4		14	
20:30			0		11		8		19	
20:45			1	3	12	39	3	19	16	61
21:00			0		10		7		17	
21:15			0		8		2		10	
21:30			0		7		7		14	
21:45			0		0	25	5	21	5	46
22:00			0		0		4		4	
22:15			0		4		5		9	
22:30			0		3		0		3	
22:45			0		5	12	2	11	7	23
23:00			0		6		3		9	
23:15			0		3		3		6	
23:30			0		1		1		2	
23:45			0		0	10	1	8	1	18
TOTALS				22		1151		905		**2078**
SPLIT %				1.1%		55.4%		43.6%		**60.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	39	1,901	1,517	3,457

AM Peak Hour	10:45	10:45	8:00	**10:45**
AM Pk Volume	5	194	134	**329**
Pk Hr Factor	0.625	0.866	0.698	**0.884**
7 - 9 Volume	5	250	226	**481**
7 - 9 Peak Hour	8:00	8:00	8:00	**8:00**
7 - 9 Pk Volume	4	156	134	**294**
Pk Hr Factor	0.500	0.929	0.698	**0.808**

PM Peak Hour	17:00	15:00	14:15	**14:15**
PM Pk Volume	5	223	204	**422**
Pk Hr Factor	0.625	0.808	0.911	**0.831**
4 - 6 Volume	6	309	172	**487**
4 - 6 Peak Hour	17:00	16:00	16:15	**16:00**
4 - 6 Pk Volume	5	168	99	**267**
Pk Hr Factor	0.625	0.840	0.707	**0.785**

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

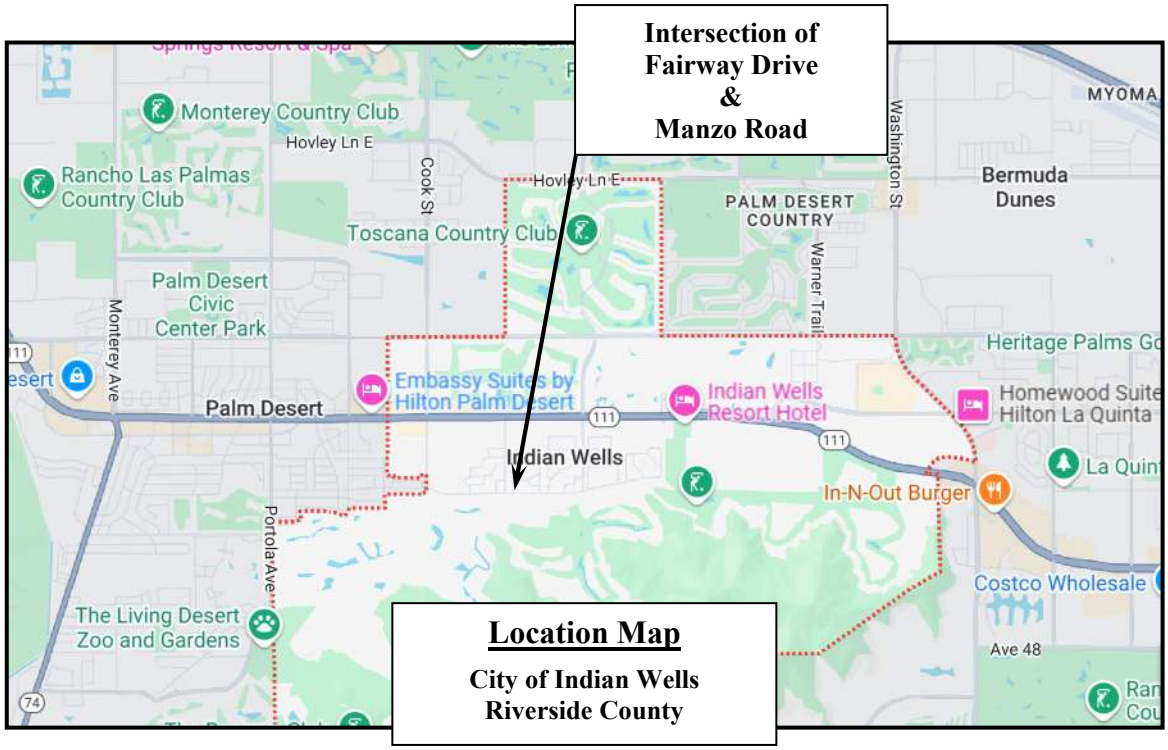
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND MANZO ROAD
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 17, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Manzo Road. 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 3-way intersection with Fairway Drive running in the east-west directions and Manzo Road in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Manzo Road.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 40 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. There is a No Trucks sign posted near Ranchero Palmeras Drive. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Manzo Road.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Manzo Road is classified as a north-south local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Manzo Road, the roadway is approximately 38 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Manzo Road. The roadway has curb and gutter improvements on both sides of the street. Manzo Road has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way STOP posted sign installation, along with STOP pavement marking and limit line, on Manzo Road at its intersection with Fairway Drive.

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

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at MANZO ROAD



FAIRWAY DRIVE (*Looking Westbound*) at MANZO ROAD

EXHIBIT 2



MANZO ROAD (*Looking Southbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Drive at Manzo Road		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,491 vehicles per day with the highest AM peak-hour volume having 331 vehicles, and 374 vehicles in the PM peak-hour. The bi-directional ADT count for Manzo Road is 121 vehicles with the highest AM peak-hour volume having 19 vehicles, and 9 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	1,941	56%	209 (3 - 4 PM)
	Westbound	1,550	44%	192 (2 - 3 PM)
Manzo Road				
	Southbound	121	100%	19 (10 - 11 AM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Manzo Road is considered the 'minor' street as drivers on Manzo Road are required to stop at Fairway Drive 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 Manzo Road carries approximately 3% of the entire vehicular traffic entering the intersection (Fairway Drive carries 97% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT MANZO ROAD

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
No, average (291) vehicles per hour for highest 8 hours		**No, average (13) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 97% of required hourly traffic volume		**Meets 7% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*97% major street / 7% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as southbound traffic on Manzo Road is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Manzo Road at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound MANZO ROAD (*Looking East*) at FAIRWAY DRIVE



Southbound MANZO ROAD (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Manzo Road is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Manzo Road. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT MANZO ROAD
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Manzo Rd & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_010

DAILY TOTALS	NB	SB	EB	WB	Total
	0	121	1,941	1,550	3,612

AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
0:00	0	0	2	2	2	12:00	0	34	39	73	
0:15	0	0	0	0	0	12:15	0	34	17	51	
0:30	0	0	0	0	0	12:30	2	23	26	51	
0:45	0	1 1	1 3	2 4		12:45	3 5	23 114	37 119	63	238
1:00	0	2	0	2	2	13:00	2	40	39	81	
1:15	0	0	0	0	0	13:15	3	40	31	74	
1:30	0	0	0	0	0	13:30	0	45	27	72	
1:45	0	0 2	0	0 2		13:45	2 7	39 164	55 152	96	323
2:00	0	0	0	0	0	14:00	1	41	42	84	
2:15	0	0	0	0	0	14:15	1	48	44	93	
2:30	0	0	0	0	0	14:30	2	45	51	98	
2:45	0	1 1	1 1	2 2		14:45	1 5	48 182	55 192	104	379
3:00	0	0	0	0	0	15:00	2	67	52	121	
3:15	0	0	0	0	0	15:15	2	48	42	92	
3:30	0	2	0	2	2	15:30	1	44	31	76	
3:45	0	1 3	1 1	2 4		15:45	1 6	50 209	31 156	82	371
4:00	0	1	0	1	1	16:00	3	43	19	65	
4:15	0	1	0	1	1	16:15	3	47	34	84	
4:30	0	1	2	3	3	16:30	2	45	23	70	
4:45	0	1 4	1 3	2 7		16:45	1 9	28 163	23 99	52	271
5:00	0	2	2	4	4	17:00	0	41	21	62	
5:15	0	4	0	4	4	17:15	1	35	18	54	
5:30	0	3	0	3	3	17:30	0	30	14	44	
5:45	0	3 12	1 3	4 15		17:45	0 1	24 130	17 70	41	201
6:00	0	2	2	4	4	18:00	0	9	15	24	
6:15	1	8	5	14	14	18:15	1	15	12	28	
6:30	2	4	4	10	10	18:30	2	6	6	14	
6:45	1 4	18 32	5 16	24 52		18:45	0 3	13 43	9 42	22	88
7:00	3	17	13	33	33	19:00	0	7	8	15	
7:15	0	15	15	30	30	19:15	0	5	1	6	
7:30	4	24	31	59	59	19:30	0	9	3	12	
7:45	6 13	35 91	39 98	80 202		19:45	0	11 32	5 17	16	49
8:00	2	47	46	95	95	20:00	0	7	3	10	
8:15	2	42	24	68	68	20:15	2	6	3	11	
8:30	8	45	27	80	80	20:30	0	11	6	17	
8:45	5 17	50 184	50 147	105 348		20:45	0 2	11 35	2 14	13	51
9:00	4	31	18	53	53	21:00	0	9	9	18	
9:15	5	28	32	65	65	21:15	0	7	2	9	
9:30	6	26	36	68	68	21:30	0	7	8	15	
9:45	2 17	45 130	35 121	82 268		21:45	1 1	1 24	5 24	7	49
10:00	6	40	31	77	77	22:00	0	0	5	5	
10:15	6	51	33	90	90	22:15	0	3	3	6	
10:30	4	37	25	66	66	22:30	0	4	0	4	
10:45	3 19	47 175	37 126	87 320		22:45	0	4 11	1 9	5	20
11:00	8	57	40	105	105	23:00	0	7	4	11	
11:15	2	56	30	88	88	23:15	1	2	3	6	
11:30	1	40	27	68	68	23:30	0	2	1	3	
11:45	0 11	35 188	31 128	66 327		23:45	0 1	0 11	1 9	1	21
TOTALS		81	823	647	1551	TOTALS		40	1118	903	2061
SPLIT %		5.2%	53.1%	41.7%	42.9%	SPLIT %		1.9%	54.2%	43.8%	57.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	121	1,941	1,550	3,612

AM Peak Hour		8:30	10:45	8:00	8:00	PM Peak Hour	12:30	15:00	14:15	14:15
AM Pk Volume		22	200	147	348	PM Pk Volume	10	209	202	416
Pk Hr Factor		0.688	0.877	0.735	0.829	Pk Hr Factor	0.833	0.780	0.918	0.860
7 - 9 Volume	0	30	275	245	550	4 - 6 Volume	0	10	293	169	472
7 - 9 Peak Hour		7:45	8:00	8:00	8:00	4 - 6 Peak Hour	16:00	16:00	16:15	16:00
7 - 9 Pk Volume	0	18	184	147	348	4 - 6 Pk Volume	0	9	163	101	271
Pk Hr Factor	0.000	0.563	0.920	0.735	0.829	Pk Hr Factor	0.000	0.750	0.867	0.743	0.807

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

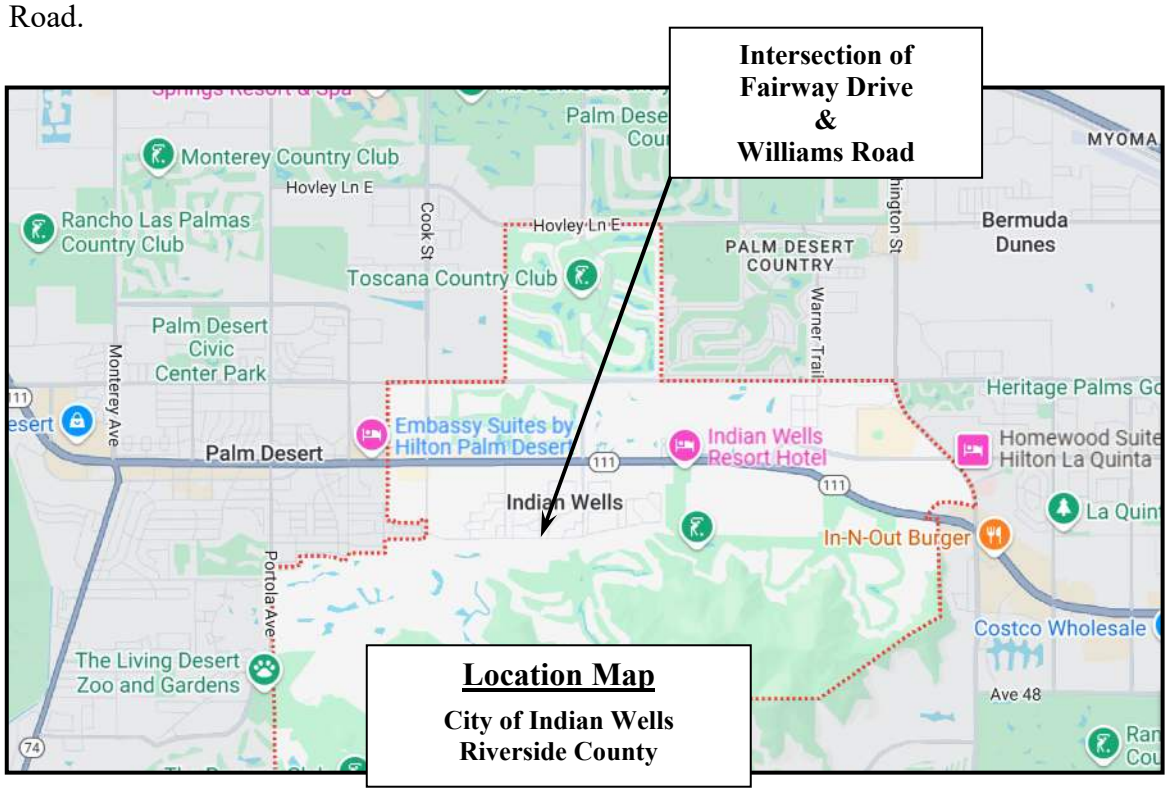
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND WILLIAMS ROAD
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 18, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Williams Road. 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 3-way intersection with Fairway Drive running in the east-west directions and Williams Road in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Williams Road.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 40 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Williams Road.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Williams Road is classified as a north-south local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Williams Road, the roadway is approximately 46 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Williams Road. The roadway has curb and gutter improvements on both sides of the street. Williams Road has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way STOP posted sign installation, along with STOP pavement marking and limit line, on Williams Road at its intersection with Fairway Drive.

See Exhibit 2 (following page) for photo image of Williams Road.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at WILLIAMS ROAD



FAIRWAY DRIVE (*Looking Westbound*) at WILLIAMS ROAD

EXHIBIT 2



WILLIAMS ROAD (*Looking Southbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Drive at Williams Road		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,478 vehicles per day with the highest AM peak-hour volume having 321 vehicles, and 380 vehicles in the PM peak-hour. The bi-directional ADT count for Williams Road is 259 vehicles with the highest AM peak-hour volume having 39 vehicles, and 28 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	1,932	56%	212 (3 - 4 PM)
	Westbound	1,546	44%	196 (2 - 3 PM)
Williams Road				
	Southbound	259	100%	39 (11 - 12 AM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Williams Road is considered the 'minor' street as drivers on Williams Road are required to stop at Fairway Drive 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 Williams Road carries approximately 7% of the entire vehicular traffic entering the intersection (Fairway Drive carries 93% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT WILLIAMS ROAD

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
Yes, average (311) vehicles per hour for highest 8 hours		**No, average (27) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 100% of required hourly traffic volume		**Meets 14% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*100% major street / 14% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as southbound traffic on Williams Road is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Williams Road at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound WILLIAMS ROAD (*Looking East*) at FAIRWAY DRIVE



Southbound WILLIAMS ROAD (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Williams Road is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Williams Road. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT WILLIAMS ROAD
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Williams Rd & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_012

DAILY TOTALS	NB	SB	EB	WB	Total
	0	259	1,932	1,546	3,737

AM Period	NB		SB		EB		WB		TOTAL	
0:00			0		0		2		2	
0:15			0		0		0		0	
0:30			0		0		0		0	
0:45			0		1	1	1	3	2	4
1:00			0		1		0		1	
1:15			0		1		0		1	
1:30			0		0		0		0	
1:45			0		0	2	0		0	2
2:00			0		0		0		0	
2:15			0		0		0		0	
2:30			0		0		0		0	
2:45			0		1	1	1	1	2	2
3:00			0		0		0		0	
3:15			0		0		0		0	
3:30			0		1		0		1	
3:45			0		0	1	2	2	2	3
4:00			0		1		0		1	
4:15			0		1		0		1	
4:30			0		0		2		2	
4:45			0		1	3	1	3	2	6
5:00			0		2		2		4	
5:15			1		3		0		4	
5:30			0		3		0		3	
5:45		1	0	3	11	2	4	5	16	
6:00			0		1		2		3	
6:15			0		6		6		12	
6:30			1		4		5		10	
6:45		2	1	20	31	8	21	29	54	
7:00			2		19		9		30	
7:15			2		16		15		33	
7:30			2		26		32		60	
7:45		10	4	33	94	38	94	75	198	
8:00			10		48		36		94	
8:15			4		39		24		67	
8:30			6		43		32		81	
8:45		35	15	58	188	41	133	114	356	
9:00			4		36		18		58	
9:15			5		30		37		72	
9:30			8		21		22		51	
9:45		21	4	49	136	40	117	93	274	
10:00			11		43		27		81	
10:15			7		50		31		88	
10:30			12		44		25		81	
10:45		37	7	49	186	36	119	92	342	
11:00			11		61		32		104	
11:15			10		57		28		95	
11:30			12		40		27		79	
11:45		39	6	35	193	30	117	71	349	
TOTALS				145		847		614		**1606**
SPLIT %				9.0%		52.7%		38.2%		**43.0%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00			10		34		40		84	
12:15			6		32		19		57	
12:30			2		25		26		53	
12:45		28	10	22	113	34	119	66	260	
13:00			8		38		39		85	
13:15			3		40		32		75	
13:30			1		42		29		72	
13:45		19	7	37	157	57	157	101	333	
14:00			2		38		48		88	
14:15			3		47		43		93	
14:30			10		44		52		106	
14:45		18	3	46	175	53	196	102	389	
15:00			6		68		58		132	
15:15			6		47		40		93	
15:30			5		48		37		90	
15:45		19	2	49	212	33	168	84	399	
16:00			0		39		23		62	
16:15			2		47		34		83	
16:30			1		46		29		76	
16:45		5	2	27	159	28	114	57	278	
17:00			4		39		19		62	
17:15			4		35		16		55	
17:30			3		28		13		44	
17:45		15	4	24	126	16	64	44	205	
18:00			0		7		15		22	
18:15			0		14		12		26	
18:30			1		5		5		11	
18:45		3	2	11	37	8	40	21	80	
19:00			1		7		8		16	
19:15			2		4		0		6	
19:30			0		9		3		12	
19:45		4	1	10	30	5	16	16	50	
20:00			0		7		3		10	
20:15			0		6		4		10	
20:30			0		11		6		17	
20:45		1	1	11	35	2	15	14	51	
21:00			0		8		9		17	
21:15			1		5		3		9	
21:30			0		7		8		15	
21:45		1	0	1	21	5	25	6	47	
22:00			0		0		5		5	
22:15			0		3		3		6	
22:30			0		2		1		3	
22:45			0		3	8	1	10	4	18
23:00			1		8		3		12	
23:15			0		2		3		5	
23:30			0		2		1		3	
23:45		1	0	0	12	1	8	1	21	
TOTALS				114		1085		932		**2131**
SPLIT %				5.3%		50.9%		43.7%		**57.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	259	1,932	1,546	3,737

AM Peak Hour		10:30	10:30	8:00	**10:30**	**PM Peak Hour**		12:00	15:00	14:15	**14:15**
AM Pk Volume		40	211	133	**372**	**PM Pk Volume**		28	212	206	**433**
Pk Hr Factor		0.833	0.865	0.811	**0.894**	**Pk Hr Factor**		0.700	0.779	0.888	**0.820**
7 - 9 Volume	0	45	282	227	**554**	**4 - 6 Volume**	0	20	285	178	**483**
7 - 9 Peak Hour		8:00	8:00	8:00	**8:00**	**4 - 6 Peak Hour**		17:00	16:00	16:00	**16:00**
7 - 9 Pk Volume	0	35	188	133	**356**	**4 - 6 Pk Volume**	0	15	159	114	**278**
Pk Hr Factor	0.000	0.583	0.810	0.811	**0.781**	**Pk Hr Factor**	0.000	0.938	0.846	0.838	**0.837**

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

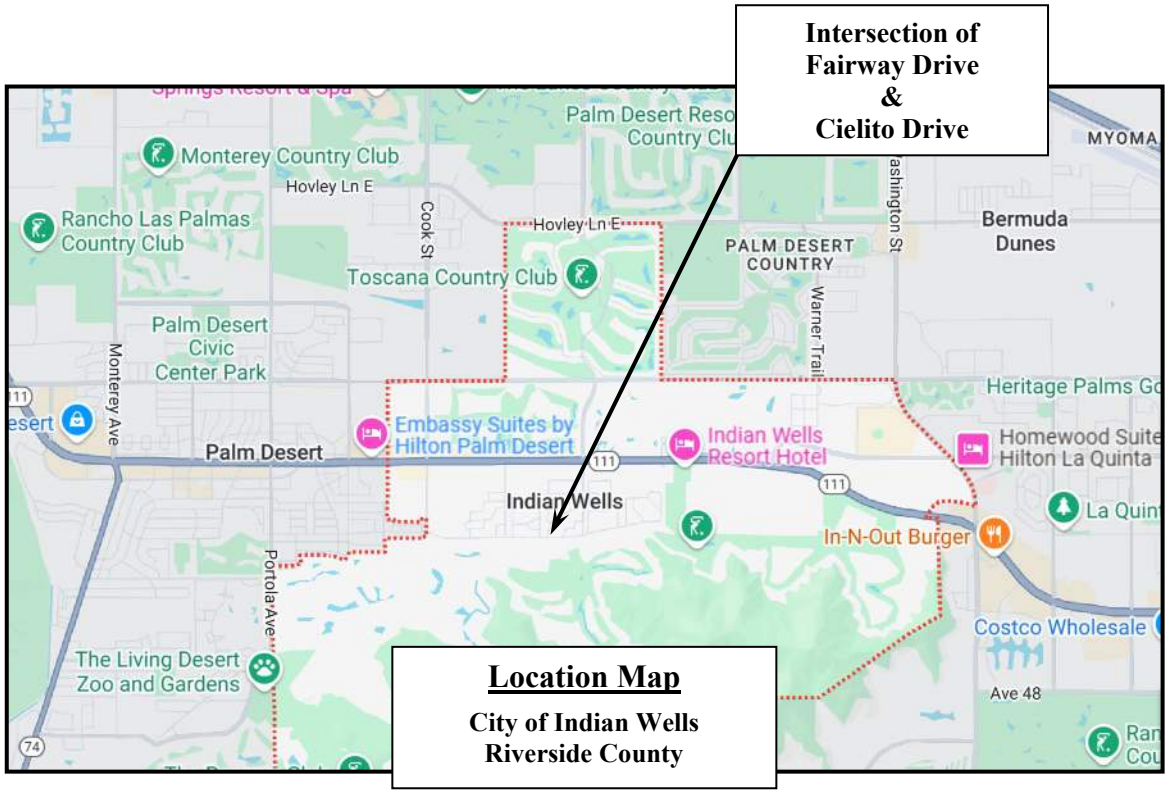
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND CIELITO DRIVE
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 19, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Cielito Drive. 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 3-way intersection with Fairway Drive running in the east-west directions and Cielito Drive in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Cielito Drive.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 40 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Cielito Drive.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Cielito Drive is classified as a north-south local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Cielito Drive, the roadway is approximately 36 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Cielito Drive. The roadway has curb and gutter improvements on both sides of the street. Cielito Drive has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way STOP posted sign installation, along with STOP pavement marking and limit line, on Cielito Drive at its intersection with Fairway Drive. There is a driveway on the south-side of Fairway Drive off-set to Cielito Drive that provides access to the private golf course resort property.

See Exhibit 2 (following page) for a photo image of Cielito Drive.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at CIELITO DRIVE



FAIRWAY DRIVE (*Looking Westbound*) at CIELITO DRIVE

EXHIBIT 2



CIELITO DRIVE (*Looking Southbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Drive at Cielito Drive		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,403 vehicles per day with the highest AM peak-hour volume having 308 vehicles, and 361 vehicles in the PM peak-hour. The bi-directional ADT count for Cielito Drive is 65 vehicles with the highest AM peak-hour volume having 23 vehicles, and 4 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	1,917	56%	213 (3 - 4 PM)
	Westbound	1,486	44%	177 (2 - 3 PM)
Cielito Drive				
	Southbound	65	100%	23 (7 - 8 AM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Cielito Drive is considered the 'minor' street as drivers on Cielito Drive are required to stop at Fairway Drive 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 Cielito Drive carries approximately 2% of the entire vehicular traffic entering the intersection (Fairway Drive carries 98% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT CIELITO DRIVE

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
No, average (212) vehicles per hour for highest 8 hours		**No, average (8) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 71% of required hourly traffic volume		**Meets 4% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*71% major street / 4% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as southbound traffic on Cielito Drive is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Cielito Drive at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound CIELITO DRIVE (*Looking East*) at FAIRWAY DRIVE



Southbound CIELITO DRIVE (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Cielito Drive is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Cielito Drive. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT CIELITO ROAD
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Cielito Dr & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_015

DAILY TOTALS	NB	SB	EB	WB	Total
	0	65	1,917	1,486	3,468

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
0:00			0		0		2		2		12:00			0		36		33		69	
0:15			0		0		0		0		12:15			0		33		21		54	
0:30			0		0		0		0		12:30			0		24		25		49	
0:45			0		1	1	0	2	1	3	12:45			0		27	120	28	107	55	227
1:00			0		1		0		1		13:00			0		40		36		76	
1:15			0		1		0		1		13:15			0		41		32		73	
1:30			0		0		0		0		13:30			1		42		31		74	
1:45			0		0	2	0		0	2	13:45			0	1	39	162	46	145	85	308
2:00			0		0		0		0		14:00			0		39		46		85	
2:15			0		0		0		0		14:15			0		44		38		82	
2:30			0		0		0		0		14:30			0		48		42		90	
2:45			0		1	1	0		1	1	14:45			1	1	44	175	51	177	96	353
3:00			0		0		0		0		15:00			0		69		47		116	
3:15			0		0		0		0		15:15			0		47		33		80	
3:30			0		1		0		1		15:30			0		48		31		79	
3:45		1	1	2	3	0		3	4		15:45			0		49	213	37	148	86	361
4:00			0		1		0		1		16:00			1		39		18		58	
4:15			0		1		0		1		16:15			2		45		33		80	
4:30			0		1		2		3		16:30			1		44		32		77	
4:45			0		1	4	1	3	2	7	16:45			0	4	28	156	32	115	60	275
5:00			1		2		1		4		17:00			0		39		17		56	
5:15			0		4		0		4		17:15			1		38		16		55	
5:30			0		3		0		3		17:30			1		28		12		41	
5:45		0	1	3	12	3	4	6	17		17:45			0	2	27	132	16	61	43	195
6:00			0		1		2		3		18:00			1		6		16		23	
6:15			4		5		4		13		18:15			1		13		11		25	
6:30			1		6		6		13		18:30			1		6		4		11	
6:45		1	6	21	33	13	25	35	64		18:45			0	3	11	36	7	38	18	77
7:00			2		19		17		38		19:00			0		8		8		16	
7:15			3		16		23		42		19:15			0		5		0		5	
7:30			6		26		27		59		19:30			0		9		3		12	
7:45		12	23	31	92	37	104	80	219		19:45			0		8	30	6	17	14	47
8:00			5		45		38		88		20:00			0		7		3		10	
8:15			3		36		27		66		20:15			0		6		4		10	
8:30			2		38		30		70		20:30			0		10		6		16	
8:45		3	13	52	171	40	135	95	319		20:45			0		11	34	2	15	13	49
9:00			4		37		18		59		21:00			0		8		9		17	
9:15			2		27		33		62		21:15			0		6		3		9	
9:30			1		18		23		42		21:30			0		7		8		15	
9:45		1	8	47	129	42	116	90	253		21:45			0		1	22	5	25	6	47
10:00			1		43		26		70		22:00			0		0		5		5	
10:15			0		44		37		81		22:15			0		3		3		6	
10:30			0		46		20		66		22:30			0		3		1		4	
10:45		0	1	47	180	32	115	79	296		22:45			0		3	9	1	10	4	19
11:00			0		60		29		89		23:00			0		7		3		10	
11:15			0		57		24		81		23:15			0		0		3		3	
11:30			0		42		28		70		23:30			0		2		0		2	
11:45		1	1	32	191	36	117	69	309		23:45			0		0	9	1	7	1	16
TOTALS			54		819		621		1494		TOTALS			11		1098		865		1974	
SPLIT %			3.6%		54.8%		41.6%		43.1%		SPLIT %			0.6%		55.6%		43.8%		56.9%	

DAILY TOTALS	NB	SB	EB	WB	Total
	0	65	1,917	1,486	3,468

AM Peak Hour		7:15	10:30	8:00	8:00	PM Peak Hour	15:45	15:00	14:15	14:15
AM Pk Volume		26	210	135	319	PM Pk Volume	4	213	178	384
Pk Hr Factor		0.542	0.875	0.844	0.839	Pk Hr Factor	0.500	0.772	0.873	0.828
7 - 9 Volume	0	36	263	239	538	4 - 6 Volume	0	6	288	176	470
7 - 9 Peak Hour		7:15	8:00	8:00	8:00	4 - 6 Peak Hour		16:00	16:00	16:00	16:00
7 - 9 Pk Volume	0	26	171	135	319	4 - 6 Pk Volume	0	4	156	115	275
Pk Hr Factor	0.000	0.542	0.822	0.844	0.839	Pk Hr Factor	0.000	0.500	0.867	0.871	0.859

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

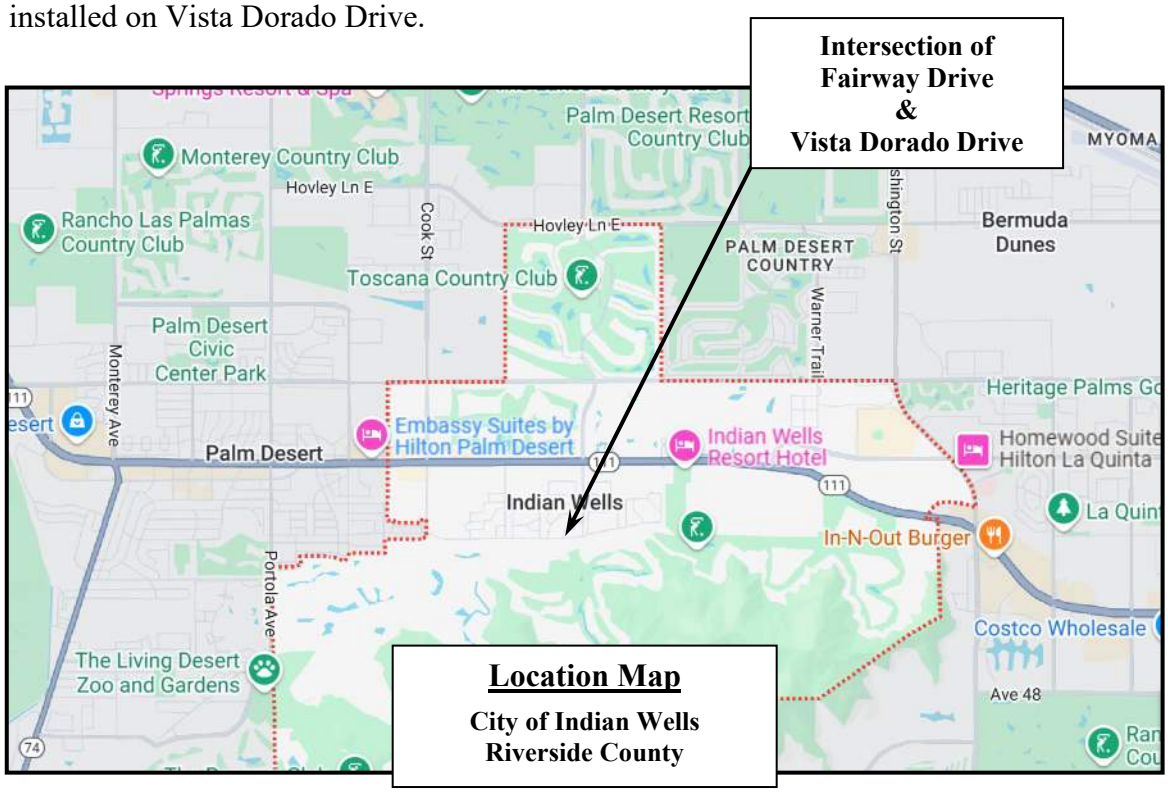
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND VISTA DORADO DRIVE
IN THE CITY OF INDIAN WELLS, CA
FEBRUARY 20, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and Vista Dorado Drive. 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 3-way intersection with Fairway Drive running in the east-west directions and Vista Dorado Drive in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on Vista Dorado Drive.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 42 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with Vista Dorado Drive.

See Exhibit 1 (next page) for photo images of Fairway Drive.

Vista Dorado Drive is classified as a north-south local roadway with single-family residential properties on both sides of the street. At its intersection with Fairway Drive, which is the southerly terminus of Vista Dorado Drive, the roadway is approximately 36 feet wide. The 2-lane roadway provides for one lane of traffic in each direction. There are no marked crosswalks across Vista Dorado Drive. The roadway has curb and gutter improvements on both sides of the street. Vista Dorado Drive has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is a one-way STOP posted sign installation, along with STOP pavement marking and limit line, on Vista Dorado Drive at its intersection with Fairway Drive.

See Exhibit 2 (following page) for a photo image of Vista Dorado Drive.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at VISTA DORADO DRIVE



FAIRWAY DRIVE (*Looking Westbound*) at VISTA DORADO DRIVE

EXHIBIT 2



VISTA DORADO DRIVE (*Looking Southbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?	Date	Type of Coll. / Correctible?
Fairway Dr at Vista Dorado Drive		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,305 vehicles per day with the highest AM peak-hour volume having 287 vehicles, and 387 vehicles in the PM peak-hour. The bi-directional ADT count for Vista Dorado Drive is 70 vehicles with the highest AM peak-hour volume having 6 vehicles, and 11 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	1,811	55%	241 (3 - 4 PM)
	Westbound	1,494	45%	181 (2 - 3 PM)
Vista Dorado Drive				
	Southbound	70	100%	12 (1 - 2 PM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, Vista Dorado Drive is considered the 'minor' street as drivers on Vista Dorado Drive are required to stop at Fairway Drive 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 Vista Dorado Drive carries approximately 2% of the entire vehicular traffic entering the intersection (Fairway Drive carries 98% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT VISTA DORADO DRIVE

Part 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***	**Part 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***	**Part 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 above values.
Results:		**Results:**		**Results:**
No, average (285) vehicles per hour for highest 8 hours		**No, average (7) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 95% of required hourly traffic volume		**Meets 4% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*95% major street / 4% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

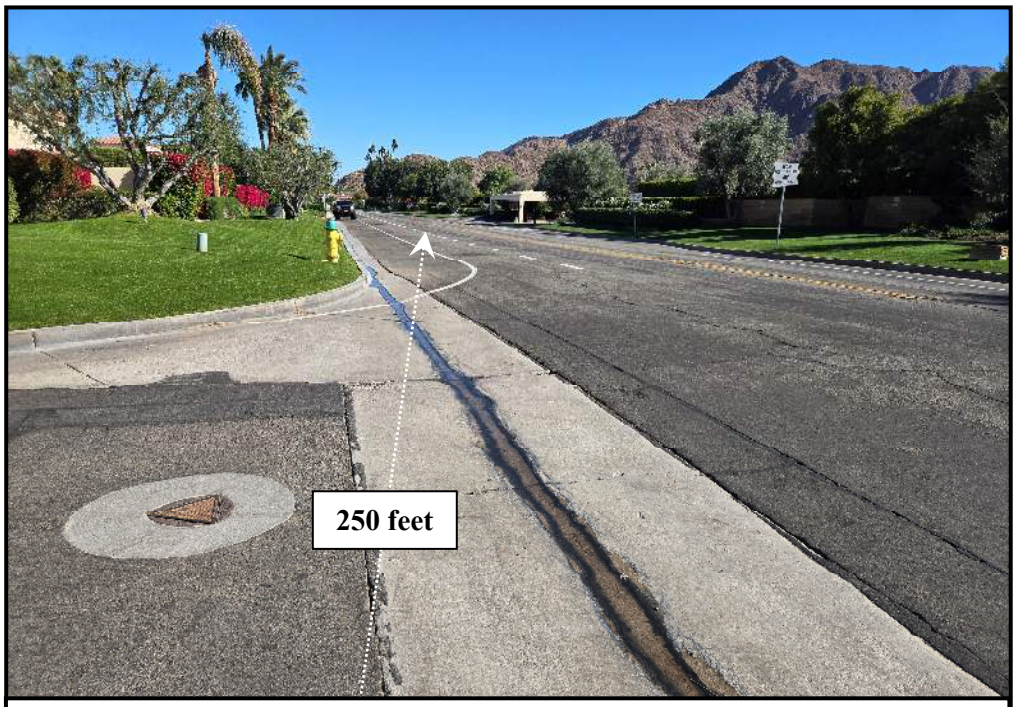
Driver sight distance was measured from the side-street approach, as southbound traffic on Vista Dorado Drive is required to stop, before making a left-turn or right-turn onto Fairway Drive. The measured sight distance was derived from the stopping sight distance guidelines found in the California MUTCD ***(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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on Vista Dorado Drive at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Southbound VISTA DORADO DRIVE (*Looking East*) at FAIRWAY DRIVE



Southbound VISTA DORADO DRIVE (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at Vista Dorado Drive is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and Vista Dorado Drive. There are no other recommendations for the intersection at this time.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT VISTA DORADO DRIVE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Vista Dorado Drive & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective

City: Indian Wells
Project #: CA25_030002_017

DAILY TOTALS	NB	SB	EB	WB	Total
	0	70	1,811	1,494	3,375

AM Period	NB		SB		EB		WB		TOTAL	
0:00			0		0		2		2	
0:15			0		0		0		0	
0:30			0		0		0		0	
0:45			0		0		0	2	0	2
1:00			0		1		0		1	
1:15			0		1		0		1	
1:30			0		0		0		0	
1:45			0		0	2	0		0	2
2:00			0		0		0		0	
2:15			0		0		0		0	
2:30			0		0		0		0	
2:45			0		0		0		0	
3:00			0		0		0		0	
3:15			0		0		0		0	
3:30			0		1		0		1	
3:45			0		1	2	0		1	2
4:00			0		1		0		1	
4:15			0		1		0		1	
4:30			0		1		3		4	
4:45			0		1	4	1	4	2	8
5:00			0		2		1		3	
5:15			0		5		0		5	
5:30			0		3		0		3	
5:45			0		3	13	3	4	6	17
6:00			0		3		2		5	
6:15			1		6		4		11	
6:30			0		5		8		13	
6:45		1	0	14	28	12	26		26	55
7:00			0		11		18		29	
7:15			1		9		27		37	
7:30			3		15		22		40	
7:45		6	2	24	59	40	107		66	172
8:00			0		24		35		59	
8:15			1		32		25		58	
8:30			1		28		34		63	
8:45		6	4	40	124	36	130		80	260
9:00			1		24		16		41	
9:15			0		19		35		54	
9:30			0		17		27		44	
9:45		2	1	47	107	36	114		84	223
10:00			0		44		26		70	
10:15			0		44		33		77	
10:30			0		43		24		67	
10:45		4	4	40	171	33	116		77	291
11:00			1		51		30		82	
11:15			0		48		23		71	
11:30			0		39		30		69	
11:45		1	0	33	171	33	116		66	288
TOTALS			20		681		619			**1320**
SPLIT %			1.5%		51.6%		46.9%			**39.1%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00			0		33		31		64	
12:15			2		31		23		56	
12:30			1		21		28		50	
12:45		4	1	26	111	25	107		52	222
13:00			2		39		36		77	
13:15			1		43		38		82	
13:30			7		38		27		72	
13:45		12	2	43	163	52	153		97	328
14:00			2		41		44		87	
14:15			3		43		39		85	
14:30			2		72		42		116	
14:45		9	2	48	204	56	181		106	394
15:00			3		78		52		133	
15:15			3		55		26		84	
15:30			5		56		32		93	
15:45		11	0	52	241	36	146		88	398
16:00			3		38		17		58	
16:15			1		42		34		77	
16:30			0		44		29		73	
16:45		6	2	29	153	32	112		63	271
17:00			0		35		19		54	
17:15			2		37		20		59	
17:30			2		27		9		38	
17:45		4	0	24	123	16	64		40	191
18:00			2		6		15		23	
18:15			0		11		11		22	
18:30			1		6		3		10	
18:45		3	0	9	32	8	37		17	72
19:00			0		9		8		17	
19:15			0		5		0		5	
19:30			0		9		3		12	
19:45			0		8	31	7	18	15	49
20:00			1		7		3		11	
20:15			0		6		4		10	
20:30			0		9		6		15	
20:45		1	0	10	32	2	15		12	48
21:00			0		8		9		17	
21:15			0		6		3		9	
21:30			0		7		8		15	
21:45			0		1	22	5	25	6	47
22:00			0		0		5		5	
22:15			0		3		3		6	
22:30			0		4		1		5	
22:45			0		3	10	1	10	4	20
23:00			0		6		3		9	
23:15			0		0		3		3	
23:30			0		2		0		2	
23:45			0		0	8	1	7	1	15
TOTALS			50		1130		875			**2055**
SPLIT %			2.4%		55.0%		42.6%			**60.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	70	1,811	1,494	3,375

AM Peak Hour	8:15	10:30	7:45	**10:15**
AM Pk Volume	7	182	134	**303**
Pk Hr Factor	0.438	0.892	0.838	**0.924**
7 - 9 Volume	12	183	237	**432**
7 - 9 Peak Hour	7:00	8:00	7:45	**8:00**
7 - 9 Pk Volume	6	124	134	**260**
Pk Hr Factor	0.500	0.775	0.838	**0.813**

PM Peak Hour	13:30	14:30	14:15	**14:15**
PM Pk Volume	14	253	189	**440**
Pk Hr Factor	0.500	0.811	0.844	**0.827**
4 - 6 Volume	10	276	176	**462**
4 - 6 Peak Hour	16:00	16:00	16:15	**16:00**
4 - 6 Pk Volume	6	153	114	**271**
Pk Hr Factor	0.500	0.869	0.838	**0.880**

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

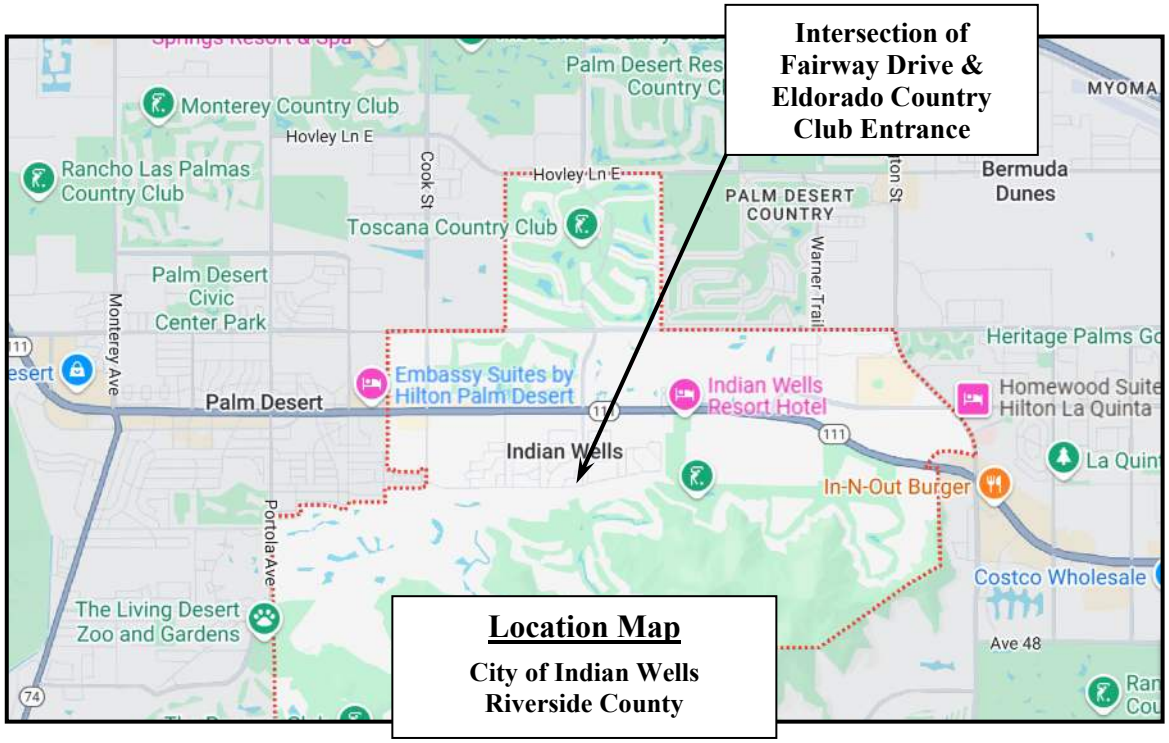
MULTIWAY STOP CONTROL WARRANTS ANALYSIS:

INTERSECTION OF FAIRWAY DRIVE AND ELDORADO COUNTRY CLUB IN THE CITY OF INDIAN WELLS, CA FEBRUARY 21, 2025

INTRODUCTION

The City of Indian Wells requested Hartzog & Crabill, Inc. (HCI) to complete a Multiway Stop Warrants Analysis for the intersection of Fairway Drive and the Eldorado Country Club entrance driveway. 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 3-way intersection with Fairway Drive running in the east-west directions and the Eldorado Country Club entrance driveway in the north-south directions. The intersection is located in the central area of the City of Indian Wells, south of Highway 111 (*see Location Map below*). The intersection is entirely within the City of Indian Wells jurisdiction. At the present time, the intersection has a one-way STOP sign control installed on the Eldorado Country Club entrance driveway.



BACKGROUND

Fairway Drive is classified as an east-west collector roadway with single-family residential properties on the north-side of the street, and a private golf course resort on the south-side. At the subject intersection, the roadway is approximately 58 feet wide. The 2-lane roadway provides for one lane of traffic in each direction divided by a double-yellow centerline, and a bicycle lane on each side. There is also an exclusive right turn lane on the eastbound approach to the driveway entrance. There are no marked crosswalks across Fairway Drive at or near the intersection. The roadway has curb and gutter improvements on both sides of the street (i.e., no sidewalk improvements). Fairway Drive has a posted speed limit of 30 MPH, on-street parking is allowed on the north-side of the street only and prohibited on the south-side via No Parking Any Time posted signs. There is a No Trucks sign posted near Eldorado Drive. Currently, there are no STOP signs or other types of traffic control on Fairway Drive (i.e., uncontrolled) at its intersection with the Eldorado Country Club entrance driveway.

See Exhibit 1 (next page) for photo images of Fairway Drive.

The Eldorado Country Club entrance driveway is classified as a north-south private local roadway with landscaped areas on both sides of the street. At its intersection with Fairway Drive, which is the northerly terminus of the entrance driveway, the roadway is approximately 96 feet wide. The 2-lane roadway provides for one lane of traffic in each direction with a welcome kiosk building in the center. There are no marked crosswalks across the entrance driveway. The roadway has curb and gutter improvements on both sides of the street. The Eldorado Country Club entrance driveway has an un-posted applicable 'local' *prima facie* speed limit of 25 MPH, and on-street parking is allowed on both sides of the street. Currently, there is no posted STOP sign installation, nor STOP pavement marking and limit line, on the Eldorado Country Club entrance driveway at its intersection with Fairway Drive.

See Exhibit 2 (following page) for a photo image of Eldorado Country Club Entrance.

EXHIBIT 1



FAIRWAY DRIVE (*Looking Eastbound*) at ELDORADO COUNTRY CLUB ENTRANCE



FAIRWAY DRIVE (*Looking Westbound*) at ELDORADO COUNTRY CLUB ENTRANCE

EXHIBIT 2



ELDORADO COUNTRY CLUB ENTRANCE (*Looking Northbound*) at FAIRWAY DRIVE

WARRANT GUIDELINES

As is common practice with many municipal agencies, the City of Indian Wells 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 of 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 3-way (multi-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.

Collision History (continued)

A comprehensive 5-year traffic collision history summary report was prepared for this intersection and reviewed for collisions susceptible to correction by the installation of a multi-way stop. Table 1 below provides the most recent summary of collision history occurring at or near this intersection.

TABLE 1
SWITRS COLLISION SUMMARY

Intersection	2020 - 2021		2022		2023		2024	
	Date	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**	**Date**	**Type of Coll. / Correctible?**
Fairway Dr at Eldorado Country Club		*None reported*		*None reported*		*None reported*		*None reported*

Notes: Information above is derived per the latest 5-year intersection 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, there have been zero (0) reported collisions 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 prepared traffic collision database report is included in Appendix B.***

Traffic Volumes

HCI collected Average Daily Traffic (ADT) vehicular approach counts on Tuesday, January 28, 2025, in order to account for vehicles that typically use this intersection. The bi-directional ADT count for Fairway Drive is 3,118 vehicles per day with the highest AM peak-hour volume having 293 vehicles, and 356 vehicles in the PM peak-hour. The bi-directional ADT count for the Eldorado Country Club entrance is 992 vehicles with the highest AM peak-hour volume having 50 vehicles, and 162 vehicles in the PM peak-hour. Table 2 (next page) provides a breakdown of the approach volumes. ***The 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
Fairway Drive	Eastbound	1,748	56%	243 (3 - 4 PM)
	Westbound	1, 370	44%	146 (8 - 9 AM)
Eldorado Country Club Entrance	Northbound	992	100%	162 (2 - 3 PM)

Fairway Drive is considered the 'through' or 'major' street at this residential 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, the Eldorado Country Club entrance driveway is considered the 'minor' street as entrance driveway drivers are required to stop at Fairway Drive and look both ways before proceeding to make a left-turn or right-turn. It is typically expected that the minor street traffic volumes are significantly less than those on the major street. As shown above, this is the case, as the entrance driveway carries approximately 24% of the entire vehicular traffic entering the intersection (Fairway Drive carries 76% 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 limit on Fairway Drive is 30 MPH. Also, a review of past 85th-percentile speeds do not exceed 40 MPH. Field observations during our site visit confirmed vehicles were regularly driving at this posted speed near the intersection, and were considered typical of 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 <u>not</u> applicable, and the 100% minimum volumes were analyzed on the next page.

Traffic Volumes (continued)

It is important to note that the 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 required for a multi-way stop application are to be satisfied for any eight (8) hours of an average day (not just for one hour).

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
FAIRWAY DRIVE AT ELDORADO COUNTRY CLUB ENTRANCE

Part 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***	**Part 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***	**Part 3.** If the 85th-percentile approach speed of the major-street traffic or exceeds 40 mph, the minimum vehicular volume warrants are (**70**) percent of the above values.
Results:		**Results:**		**Results:**
No, average (263) vehicles per hour for highest 8 hours		**No, average (89) vehicles per hour for highest 8 hours**		**No, 85th percentile speed on major-street does not exceed 40 mph**
Meets 88% of required hourly traffic volume		**Meets 45% of required hourly traffic volume**		

As shown above, the average hourly intersection approach traffic volumes for the highest 8-hour period did not satisfy both Parts 1 and 2 (*88% major street / 45% minor street*). Therefore, the minimum traffic volume warrant is not satisfied.

Visibility

The geometry of the intersecting roadways includes an approximate 90° angle, which is helpful for side-street sight distance. In addition, the intersection does not require accounting for any horizontal or vertical roadway curvature. However, impaired visibility, or restricted sight distance, due to other possible obstructions was carefully considered during our field-review of the surrounding residential neighborhood property environment.

Driver sight distance was measured from the side-street approach, as northbound traffic on the Eldorado Country Club entrance driveway is required to stop, before making a left-turn or right-turn onto Fairway Drive. 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. 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 Fairway Drive. More specifically, this stopping sight distance was field-measured from a typical 'stopped' vehicle location on the entrance driveway at the intersection looking towards the oncoming lanes of cross-traffic on Fairway Drive. 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 Exhibit 3 on the following page***).

As shown on Exhibit 3, a clear line of sight was achieved when looking from the side-street approach.

EXHIBIT 3



Northbound ELDORADO COUNTRY CLUB (*Looking East*) at FAIRWAY DRIVE



Northbound ELDORADO COUNTRY CLUB (*Looking West*) at FAIRWAY DRIVE

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., Fairway Drive). 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 most recent collision history at the intersection resulted in zero (0) SWITRS-reported collisions 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 minor street traffic volumes required for a multi-way stop that are to be satisfied for any eight (8) hours in an average day were also not satisfied. Excessive delay to the side-street approach was not observed in terms of stopping and waiting for a gap on the major roadway. Therefore, since intersection collision history and traffic volumes did not satisfy the minimum guidelines, it can also be derived that a traffic signal (as mentioned in 1) above) is not justified as an interim measure at this intersection. The 80% combined criteria were also not met as both the collisions and minimum traffic volumes were not satisfied to this percentage. 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. As mentioned, it was determined that a driver does have a clear line of sight to the conservative minimum sight distance of 250 feet.

MULTIWAY STOP ANALYSIS SUMMARY (*continued*)

In regards to pedestrian and bicycle activity, field observations during our morning weekday site visit confirmed a medium activity of both.

Therefore, based upon the gathered data and overall engineering judgment, it is determined that stopping traffic on Fairway Drive at the Eldorado Country Club entrance driveway is not required to enhance traffic safety at this intersection at this time.

RECOMMENDATION

In overall consideration of the analysis criteria in this report, a multi-way (3-way) stop sign installation is not recommended for the intersection of Fairway Drive and the Eldorado Country Club entrance driveway.

Since there is no STOP sign installed on the minor street, in order to better assign right-of-way at this intersection, it is recommended to post one (1) STOP sign facing the Eldorado Country Club driveway approach to the intersection (i.e., 1-Way Stop control). If the City approves this recommendation, the cost for this installation is in the approximate range of $250.00 to $400.00.

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 INDIAN WELLS
INTERSECTION OF FAIRWAY DRIVE AT ELDORADO COUNTRY CLUB ENTRANCE
5-YEAR SWITRS COLLISION HISTORY
JAN. 1, 2020 - DEC. 31, 2024

CASE ID	COLL. DATE	COLL. TIME	PRIMARY ROAD	SECONDARY ROAD	DIST.	DIR.	INTERS.	WEATH. 1	COLL. SEVERITY	PRIM. COLL. FACT.	PCF VIOL CAT.	PCF VIOL.	HIT AND RUN	TYPE OF COLL.	MOTOR VEHICLE INVOLVED WITH	ROAD SURF.

No Collisions Reported.

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

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

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

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

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

APPENDIX C

AVERAGE DAILY TRAFFIC (ADT)
COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Eldorado Country Club Entrance Driveway & Fairway Dr

Day: Tuesday
Date: 1/28/2025

Highest 8 Hours per Side-Street Perspective.

City: Indian Wells
Project #: CA25_030002_027

DAILY TOTALS	NB	SB	EB	WB	Total
	992	0	1,748	1,370	4,110

AM Period	NB		SB		EB		WB		TOTAL	
0:00	8				0		1		9	
0:15	0				0		0		0	
0:30	0				0		0		0	
0:45	0	8			0		0	1	0	9
1:00	0				1		0		1	
1:15	0				1		0		1	
1:30	0				0		0		0	
1:45	0				0	2	0		0	2
2:00	0				0		0		0	
2:15	0				0		0		0	
2:30	0				0		0		0	
2:45	0				0		0		0	
3:00	0				0		0		0	
3:15	0				0		0		0	
3:30	0				1		1		2	
3:45	0				0	1	1	2	1	3
4:00	0				1		1		2	
4:15	0				1		2		3	
4:30	3				1		1		5	
4:45	1	4			1	4	6	10	8	18
5:00	2				2		3		7	
5:15	0				3		5		8	
5:30	0				3		9		12	
5:45	3	5			3	11	21	38	27	54
6:00	1				1		4		6	
6:15	2				3		5		10	
6:30	2				6		12		20	
6:45	3	8			12	22	28	49	43	79
7:00	4				11		25		40	
7:15	3				8		30		41	
7:30	5				14		24		43	
7:45	5	17			23	56	48	127	76	200
8:00	6				25		41		72	
8:15	13				30		31		74	
8:30	14				28		41		83	
8:45	16	49			41	124	33	146	90	319
9:00	8				20		25		53	
9:15	13				23		32		68	
9:30	11				16		32		59	
9:45	16	48			41	100	36	125	93	273
10:00	9				40		25		74	
10:15	13				42		44		99	
10:30	12				39		33		84	
10:45	16	50			36	157	34	136	86	343
11:00	14				42		34		90	
11:15	11				50		26		87	
11:30	11				39		29		79	
11:45	8	44			32	163	33	122	73	329
TOTALS		233				640		756		**1629**
SPLIT %		14.3%				39.3%		46.4%		**39.6%**

PM Period	NB		SB		EB		WB		TOTAL	
12:00	9				33		28		70	
12:15	11				31		22		64	
12:30	12				18		25		55	
12:45	29	61			22	104	16	91	67	256
13:00	26				35		20		81	
13:15	18				44		34		96	
13:30	27				42		21		90	
13:45	45	116			40	161	24	99	109	376
14:00	46				42		24		112	
14:15	42				39		22		103	
14:30	38				66		20		124	
14:45	36	162			55	202	47	113	138	477
15:00	39				79		42		160	
15:15	27				55		18		100	
15:30	22				59		27		108	
15:45	31	119			50	243	26	113	107	475
16:00	20				38		12		70	
16:15	24				41		22		87	
16:30	22				43		29		94	
16:45	27	93			26	148	26	89	79	330
17:00	28				33		13		74	
17:15	16				36		13		65	
17:30	10				29		9		48	
17:45	10	64			23	121	15	50	48	235
18:00	18				6		2		26	
18:15	13				11		3		27	
18:30	6				6		3		15	
18:45	7	44			7	30	7	15	21	89
19:00	8				9		3		20	
19:15	0				7		0		7	
19:30	4				8		2		14	
19:45	4	16			8	32	6	11	18	59
20:00	3				7		3		13	
20:15	7				6		0		13	
20:30	9				9		2		20	
20:45	4	23			7	29	4	9	15	61
21:00	11				8		3		22	
21:15	9				5		3		17	
21:30	10				8		3		21	
21:45	7	37			0	21	2	11	9	69
22:00	7				1		0		8	
22:15	5				3		3		11	
22:30	1				2		1		4	
22:45	0	13			3	9	2	6	5	28
23:00	5				6		5		16	
23:15	5				0		2		7	
23:30	0				2		0		2	
23:45	1	11			0	8	0	7	1	26
TOTALS		759				1108		614		**2481**
SPLIT %		30.6%				44.7%		24.7%		**60.4%**

DAILY TOTALS	NB	SB	EB	WB	Total
	992	0	1,748	1,370	4,110

AM Peak Hour	10:15		10:30	7:45	**10:15**	**PM Peak Hour**	13:45	14:30	14:45	**14:15**
AM Pk Volume	55		167	161	**359**	**PM Pk Volume**	171	255	134	**525**
Pk Hr Factor	0.859		0.835	0.839	**0.907**	**Pk Hr Factor**	0.929	0.807	0.713	**0.820**
7 - 9 Volume	66	0	180	273	**519**	**4 - 6 Volume**	157	0	269	139	**565**
7 - 9 Peak Hour	8:00		8:00	7:45	**8:00**	**4 - 6 Peak Hour**	16:15	16:00	16:15	**16:15**
7 - 9 Pk Volume	49	0	124	161	**319**	**4 - 6 Pk Volume**	101	0	148	90	**334**
Pk Hr Factor	0.766	0.000	0.756	0.839	**0.886**	**Pk Hr Factor**	0.902	0.000	0.860	0.776	**0.888**

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